

MARCH  
1961

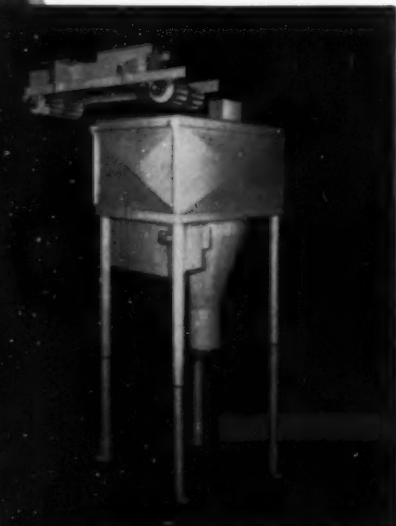
# **COMMERCIAL FERTILIZER**

**and PLANT FOOD INDUSTRY**

***HOW YOU CAN HELP TO...***

***“GET ME TO YOUR  
PLANT ON TIME!”***

**SEE PAGE 19**



Sooner or Later  
You'll be Packaging  
Your Fertilizer in

**50!**  
**POUND**  
**BAGS!**

## Sooner or Later You'll be Wanting **THE KRAFTPACKER**

**AUTOMATIC OPEN MOUTH BAG FILLING MACHINE  
WITH 4 OZ. + OR - ACCURACY UP TO 25 BAGS PER MIN.  
FOR AN AVERAGE OF OVER 400 TONS PER 8-HOUR DAY**

### *Why not investigate it NOW?*

The Kraftpacker has a 5 year record of consistently true accuracy and high production with all types of fertilizers under all bagging conditions in 31 states and several foreign countries.

Models to accommodate 25 lb. to 100 lb. weights and from 50 lb. to 200 lb.

*We'll send you a brochure, of course - Write Dept. F61...but we'll also arrange for a free demonstration nearby!*

If your product can be packaged in a multiwall bag - we'll make the Kraftpacker to fill your bags - and we'll make the bags to fit your product! Our new 300,000 sq. ft. bag plant, close to our integrated paper mill, is equipped to produce every kind of multiwall bag used in fertilizer packaging.

### *Exclusive Sales Agents*

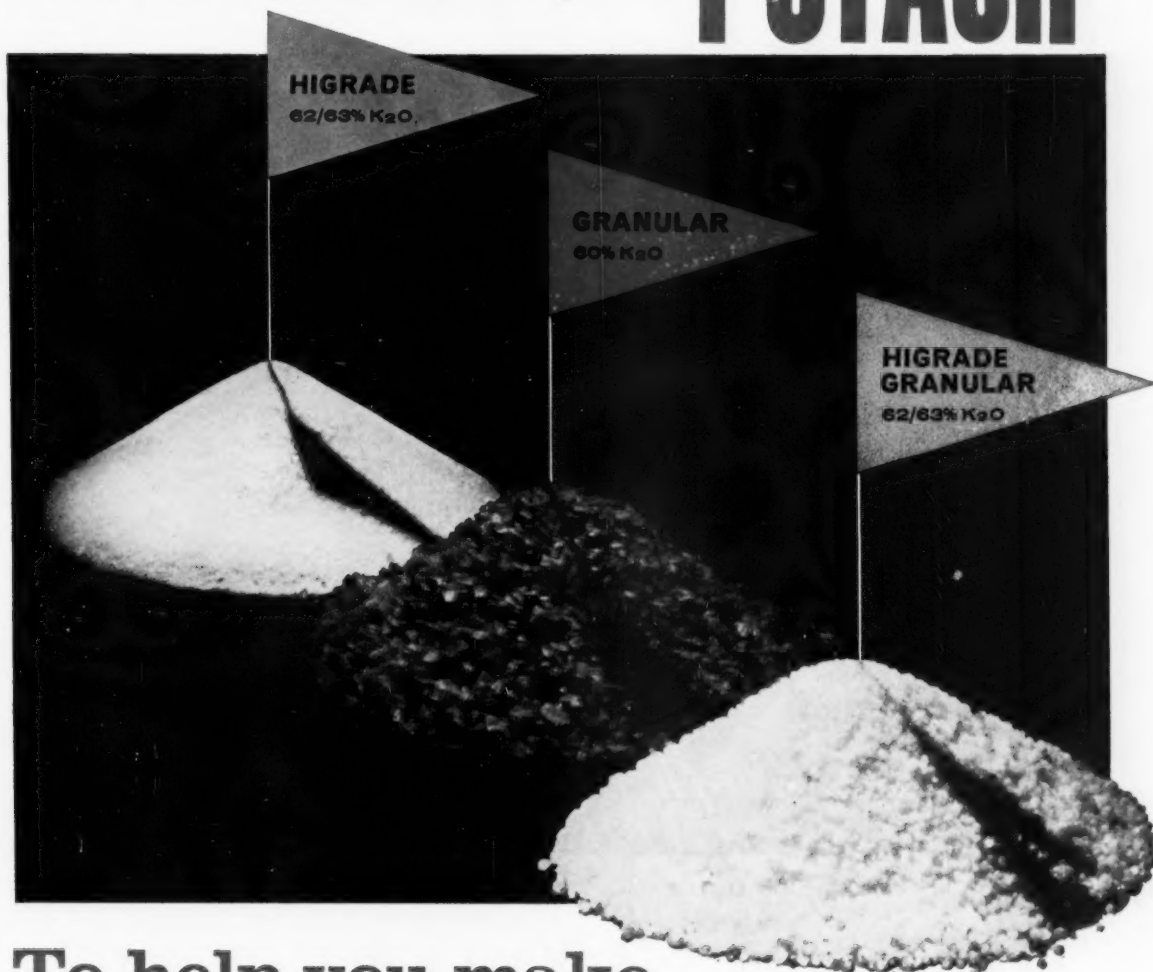
The **KRAFT BAG** Div.  
of St. Marys Kraft Corp., Subsidiary of  
**GILMAN PAPER COMPANY**  
630 FIFTH AVENUE, NEW YORK 20, NEW YORK  
400 W. MADISON STREET, CHICAGO 6, ILLINOIS



- ☐ We are interested in your Kraftpacker.
- ☐ We are interested in improving our bag.

COMPANY NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_  
PRINCIPAL \_\_\_\_\_  
PRODUCT MFD. \_\_\_\_\_ CF

# For you-- 3 types of specially sized **POTASH**



To help you make  
the best fertilizers...

**Now Available!**  
**FERTILIZER BORATE-65**  
... A NEW SOURCE OF BORON  
TO SAVE YOU MONEY!

Here's boron at lowest cost per unit! This highly concentrated source of  $B_2O_3$  has a 178% borax equivalent. It can save dollars for you on costs of handling... storage... and transportation. It can also improve the physical condition of your mixed fertilizers.

**Order Fertilizer Borate-65 now!**

Here is potash you can depend upon—for highest quality—for maximum freedom from caking in storage and handling. Take your choice of three types; all readily available for immediate shipment. You'll find each to be ideally sized to meet your current manufacturing requirements.

For more than a quarter of a century, our potash products have kept pace with all the exacting specifications of the fertilizer industry. That's why you can confidently count on getting exactly the kind of potash you want... when you want it... from U. S. Borax & Chemical Corp.

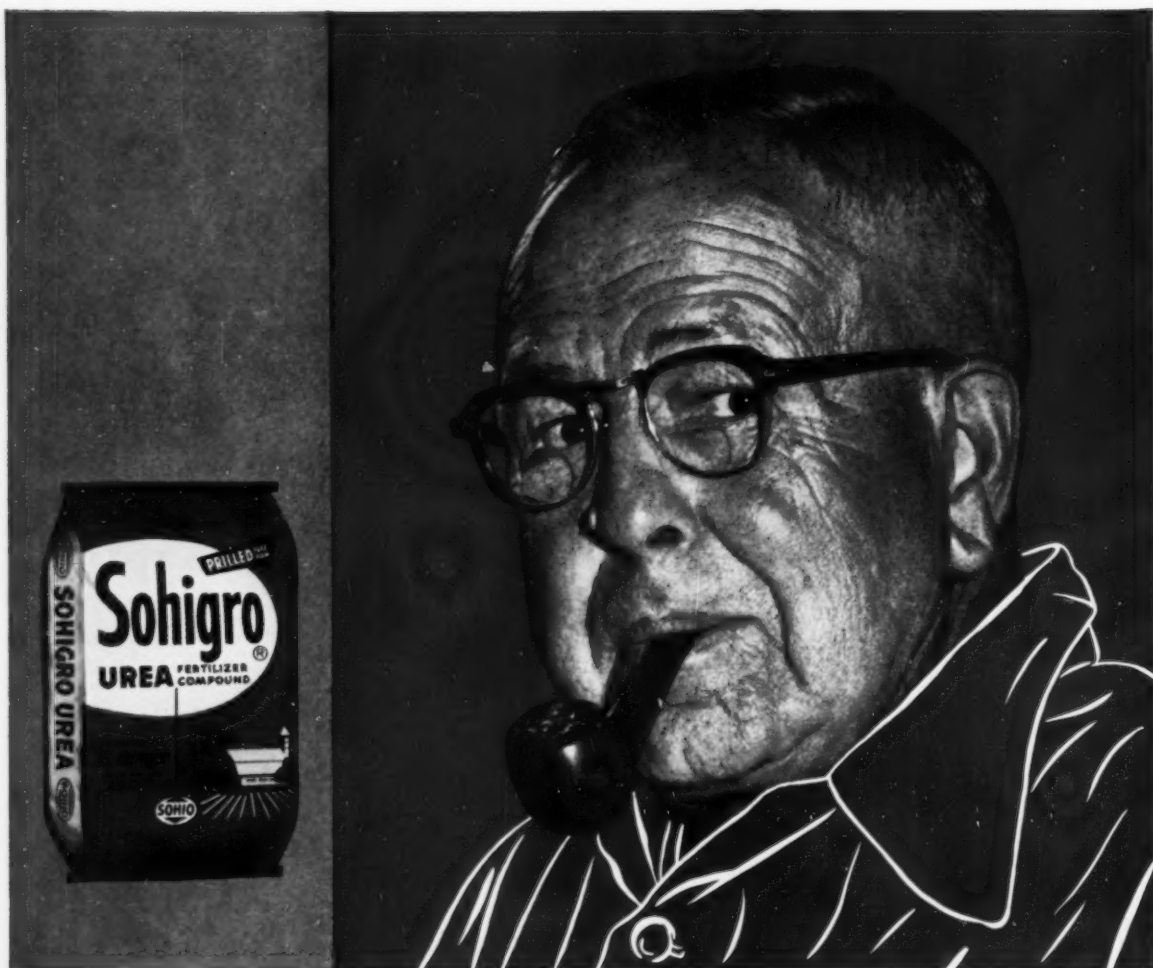
Expert technical assistance is yours for the asking—without any obligation. Write today for technical data and shipping information.

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Sales Offices in:

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## "Sell Sohigro? What's in it for me?"

Good question. There are many brands of urea. So why should you sell Sohigro Urea instead of something else? What's in it for you?

**Easy to sell:** First, the product is a pleasure to use and gives results worth bragging about. Sohigro Urea earns its good reputation right in the field. Sohio helps spread the word with farm magazine advertising, intensive radio selling. Adds up to more people asking for Sohigro and an easier selling job for you.

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buy when they know you're the man who can deliver Sohigro Urea.

**Easy to get:** Lima is the hub of major highways and 5 leading rail lines . . . fast routes for swift, direct delivery. And you'll find fast service and excellent dock facilities if you make your own plant pickup (easily arranged through your supplier).

What's in it for you? More sales, easier sales, fastest possible service. Extra volume and profits during what shapes up as a boom year for supplemental nitrogen. Get your share with prilled, easy-applying, resultful Sohigro Urea.



*. . . we're serious about SERVICE at Sohio*  
**SOHIO CHEMICAL COMPANY**  
 Agent for Solar Nitrogen Chemicals, Inc.

Fort Amanda Rd., P.O. Box 628 • Lima, Ohio  
 Phone CApital 5-8015 or wire (TWX call letters LIMA 0 497-U)

A-5

COMMERCIAL FERTILIZER

published monthly by  
**Walter W. Brown Publishing Company, Inc.**  
 75 Third Street, N. W.  
 Atlanta 8, Georgia  
 Phone TRinity 4-4160

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Subscription rates:  
 United States \$3.00 per year; 3 years, \$7.50.  
 Canada: \$5.00 per year; 3 years, \$12.00.  
 Foreign: \$10.00 per year; 3 years, \$24.00.  
 Single copy: current issue, 50 cents;  
 back issues, \$1.00.

## COMMENTING FREELY

by

Bruce Moran

It is my personal opinion that voices out of Washington are right when they complain that it is a pretty tough job to help farmers who cannot agree on what kind of help they need.

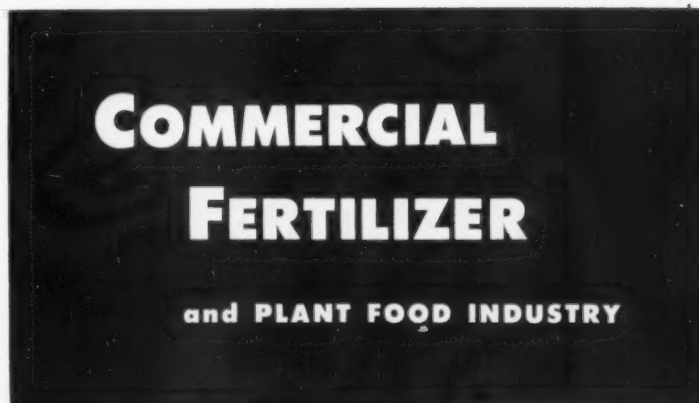
But the picture is a broader one than that.

There are the questions economists ask . . . "Can the marginal farmer be helped, really? Would not the whole farm economy be a sound one if the marginal farmer were moved into some other activity, so he would no longer depress prices? Would not prices to the consumer stay in line better if the efficiently managed farm was the source of supply?"

These are good questions, but they distress politicians, because a lot of little farmers have a lot more votes than one big farmer . . . and, anyhow, politicians think the public is afraid of size in any field. So the politicians are afraid.

But if the big organizations, who represent so many thousands of farmers, large and small, were to join their voices in harmony on the subject - some progress might be made toward solving the vexing farm problem.

Naturally, nobody would think of letting nature take its course! That would solve the program too quickly, and without credit to the men who need the votes.



Vol. 102, No. 3

March, 1961

Established 1910

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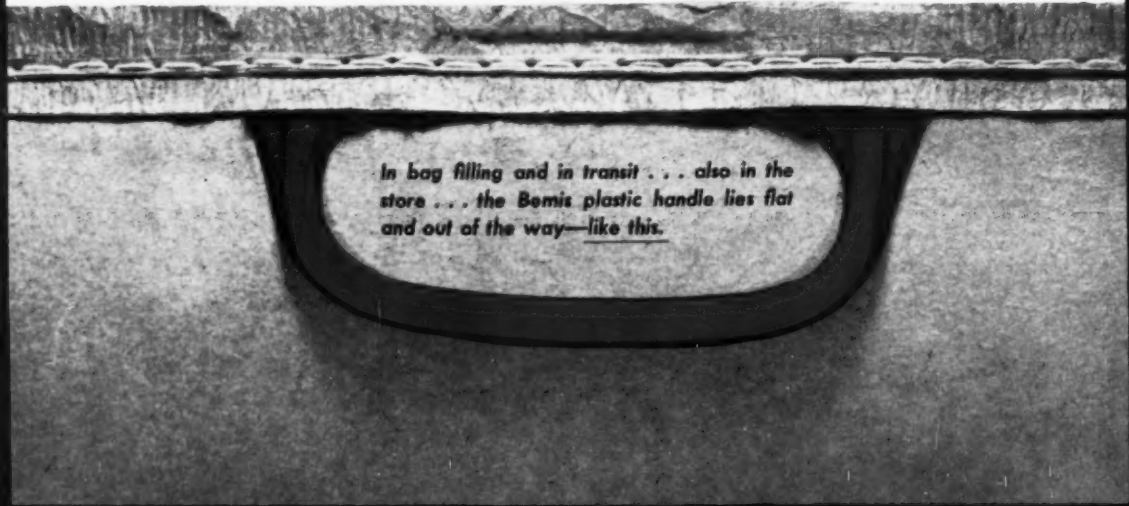
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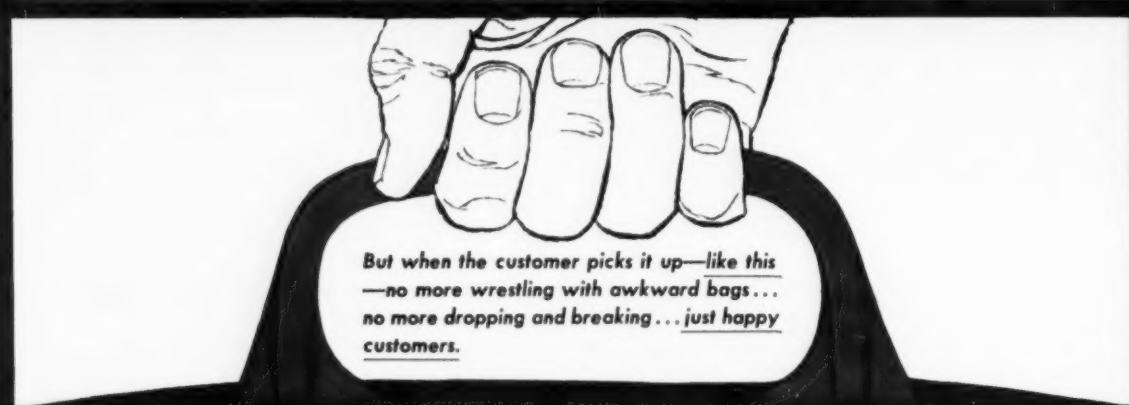
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Second-class postage paid at Atlanta, Georgia. COMMERCIAL FERTILIZER and Plant Food Industry is published monthly by Walter W. Brown Publishing Co., Inc., 75 Third St., N. W., Atlanta 8, Georgia.

ANNOUNCING...THE FIRST  
COMPLETELY SATISFACTORY  
HANDLE FOR MULTIWALL BAGS!



*In bag filling and in transit... also in the store... the Bemis plastic handle lies flat and out of the way—like this.*



*But when the customer picks it up—like this—no more wrestling with awkward bags... no more dropping and breaking... just happy customers.*

## Bemis Handle Bag

WITH MOLDED PLASTIC HANDLE!

*A major merchandising advance! Look at these benefits: Won't break • Won't pull loose • Molded to fit the hand comfortably • Easy to carry • Available in 4 colors—red, black, green, yellow • Enhances the appearance of your package.*

Bemis Handle Bags are ideal sales-building packages for dog food, rock salt, fertilizer... actually, just about anything you would package in bags up to 25- or 30-lb. capacity.

Ask your Bemis Man for the complete Handle Bag story.

**Bemis**

*Where flexible  
packaging ideas are born*



GENERAL OFFICES—408 PINE STREET, ST. LOUIS 2 • SALES OFFICES IN PRINCIPAL CITIES

Newest member of the Davison  
team of granulated phosphates...

# 16-48-0

## DAVISON Diammonium Phosphate

**MAKES HIGHER ANALYSIS MIXTURES . . .** than before—and makes them more easily. 16 units of highly soluble NITROGEN—Plus 48 guaranteed units of AVAILABLE  $P_2O_5$ .  
**FOR DIRECT APPLICATION . . .** an exact 1-3-0 ratio—ready to use and sell . . . beautifully granulated.

**FOR DRY MIXING . . .** Davison Diammonium affords the dry blend manufacturer the advantages of an ammoniation plant. A balanced 1-3-0 ratio simplifies formula calculations.

**READY FOR SHIPMENT . . .** right now. Make this profitable new phosphate part of your operation. Call Davison in Baltimore today at SARatoga 7-3900.

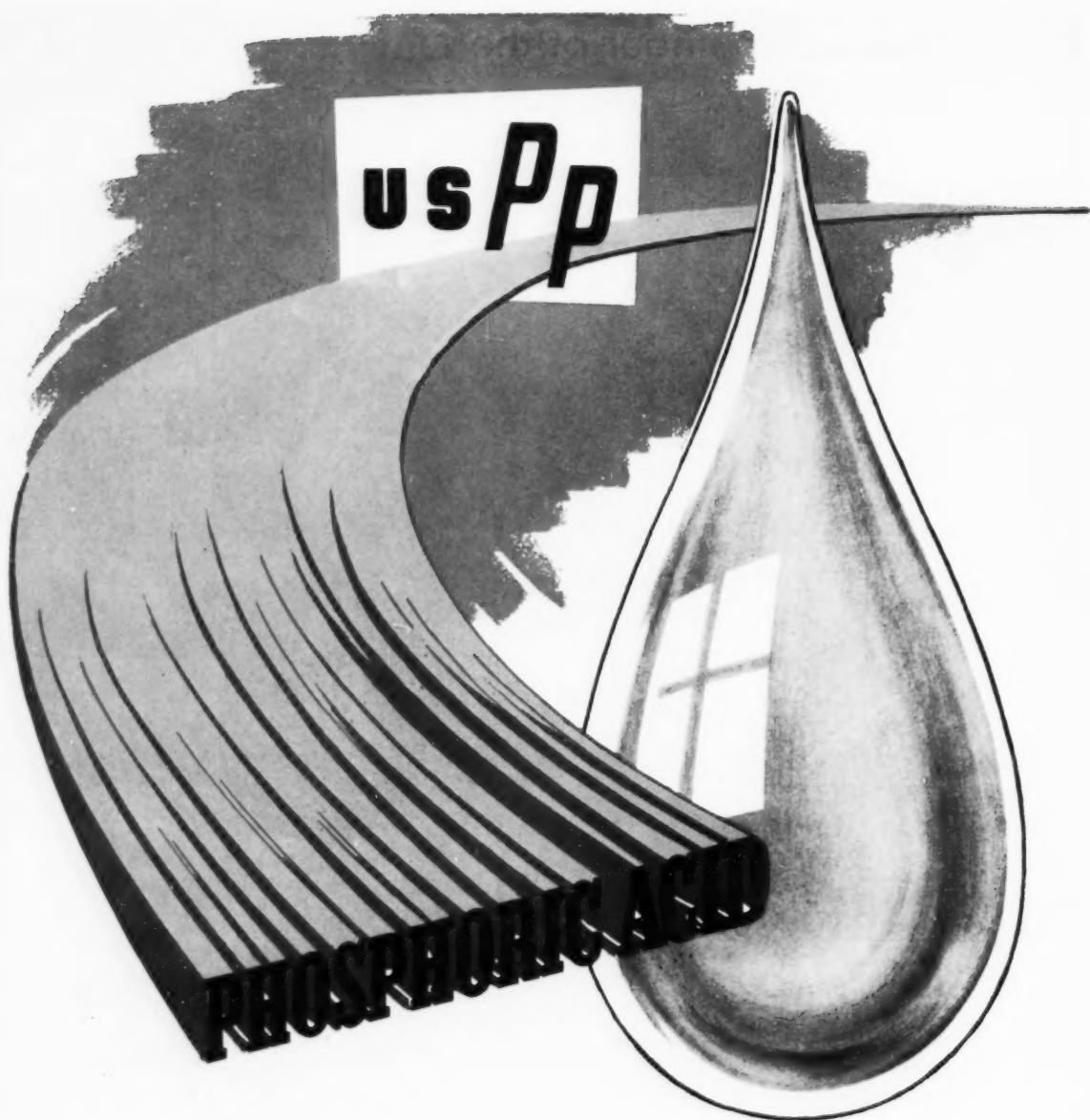


DAVISON CHEMICAL Agricultural Chemicals Division, Baltimore 3, Md.

Some formulations of ratios in higher analysis grades using DAVISON 16-48-0

Ratio Analysis	Pounds of Material Required			
	16-48-0	Ammo. Sul. (21%N)	Triple (46% $APA$ )	Polash (60% $K_2O$ )
1-1-1 14.4-14.4-14.4	602	917		481
1-2-2 11-22-22	917	349		734
1-4-2 8.5-34-17	1063		370	567
1-4-4 6.6-26.5-26.5	828		290	882

\*Other higher analysis nitrogen materials (urea and ammonium nitrate) may be substituted in above formulations. Analysis in the more popular ratios, such as 12-12-12, 10-20-20, 6-24-12, 5-20-20, can be manufactured by the addition of granular dolomitic limestone or other materials.



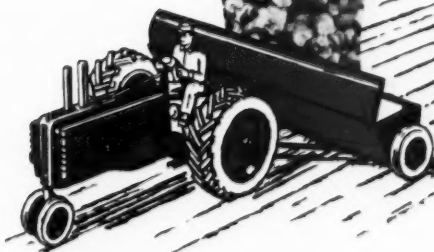
**Wet Process Acid of Highest Quality**  
**52-54%  $P_2O_5$**   
**Solids less than 1% by weight**

**Headquarters For All Phosphate Used in High-Analysis Fertilizers**

**us Pp**

**GRANULAR**

**Triple Superphosphate**



For requirements contact our Sales Agent—BRADLEY & BAKER

**U.S. PHOSPHORIC PRODUCTS**  
TAMPA, FLORIDA

TENNESSEE



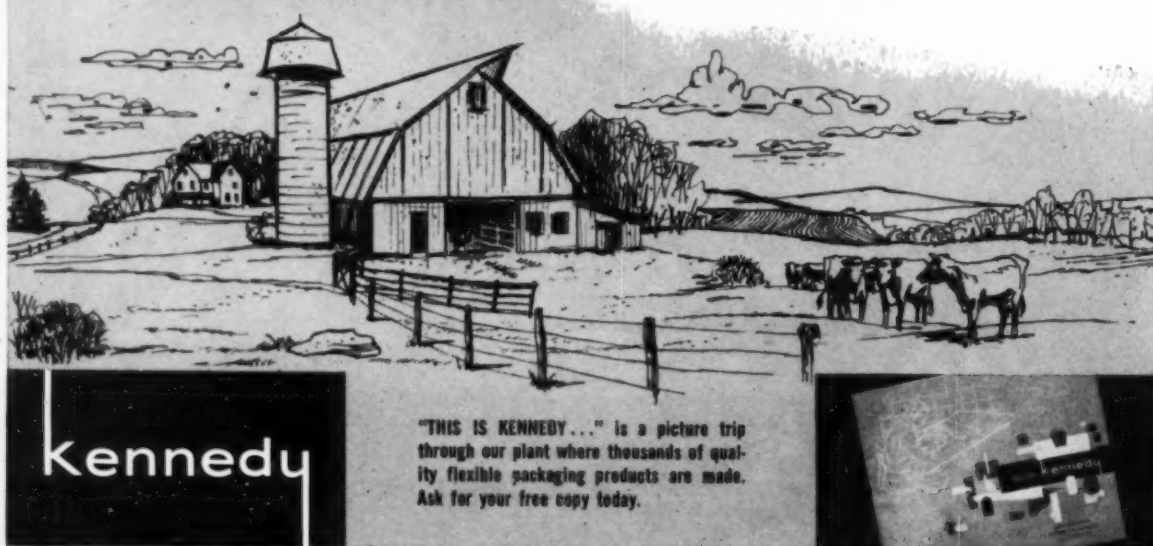
CORPORATION



## Kennedy bags PROTECT AND SELL

—deliver their contents in  
"Factory-Fresh" condition

Built of selected materials to best do their job, Kennedy multi-wall bags for all types of bulk materials are "Traveling Salesmen" for your products the country over. Incorporating your own design or one our design department develops for you, Kennedy bulk material multi-wall bags are economical and dependable. We'd like to talk your bag problems over with you. Write or phone us today.



"THIS IS KENNEDY..." is a picture trip through our plant where thousands of quality flexible packaging products are made. Ask for your free copy today.

### KENNEDY CAR LINER & BAG COMPANY, INC.

9000 Prospect Ave., Dept. C, Shelbyville, Indiana

***This familiar symbol***



***represents the extra care  
that goes into ...***

# SWIFT'S MINUTE MAN PHOSPHATES

**Phosphate Rock—Ground and Uground  
Triple Superphosphate**

Extra care at Swift's Phosphate Center means extra care in every stage of filling your needs . . . extra care in prospecting and mining . . . extra care in processing and quality control . . . extra care in scheduling and shipping . . . even extra care in record keeping.

It is the kind of extra care you get only from people who know they serve themselves best by serving you best, just as the Minute Man, who symbolizes Swift's phosphatic products, served himself by serving others.

You'll enjoy doing business with Swift's Phosphate Center . . . with dedicated people who want to serve you with extra care. Have a Swift Phosphate Center Representative outline the advantages Swift's service offers you in phosphates—triple, phosphate rock or ground phosphate rock.

THE SERVICE CENTER FOR ALL YOUR PHOSPHATE NEEDS

**SWIFT & COMPANY  
Phosphate Center • Bartow, Florida**



*To Serve Your Industry Better*

**WITH MINUTE MAN PHOSPHATE ROCK, GROUND  
PHOSPHATE ROCK AND TRIPLE SUPERPHOSPHATE**



## JUST AROUND THE CORNER

By Vernon Mount



CRYING WOLF may help shock the nation into some sort of action, and it may well be a force to push Congress into passage of "emergency" bills. But it has real danger - because depressions are part economic and part psychological.

SPREAD OUT, as it has been over a considerable period, this recession or dip or slow-up, or whatever you choose to call it, has not hurt the over-all economy too much, though it has hurt some segments pretty badly. The sound economists feel the worst is nearly over, and we should see daylight soon and real improvement not too long after that.

INVESTMENT in capital goods has not softened as much as would be the case if we had a real depression on our hands. The men who spend the millions for plants and equipment are about as well equipped with economic counsel as is the President. And they make their judgements on what they know, rather than what they hear.

AND THAT is a better gauge than the headlines out of Washington.

Yours faithfully,

*Vernon Mount*

if you're looking for excellence...look for the "E"

- **AMMO-NITE**  
ammonium nitrate fertilizer
- **BAY-SOL**  
nitrogen solutions
- **ANHYDROUS AMMONIA**



Technical Service Representatives Are Available To Help You  
At Any Time With Any Problem. 24 Hour Production For Extra Service.

Manufactured by  
**ESCAMBIA CHEMICAL CORPORATION**  
Pensacola, Florida

Exclusive Sales Agents  
**ASHCRAFT-WILKINSON COMPANY**  
Atlanta, Georgia



“I’m a  
bag that  
gets knocked  
around a  
lot in my  
business.”



“Me, too. And I don’t think I could stand it if Chase didn’t know  
how to pick the paper!” Fact! Chase buys all these types of paper  
on the open market: stretchable, non-skid, creped or regular kraft...fully bleached, semi-bleached  
and colored outer sheets. This means Chase has the pick of the best from *many* sources. Result: Bags  
with maximum strength, minimum bulk, more value for you. You pay no more for the *best* bags,  
beautifully printed. Make sure you  
get them—from Chase!

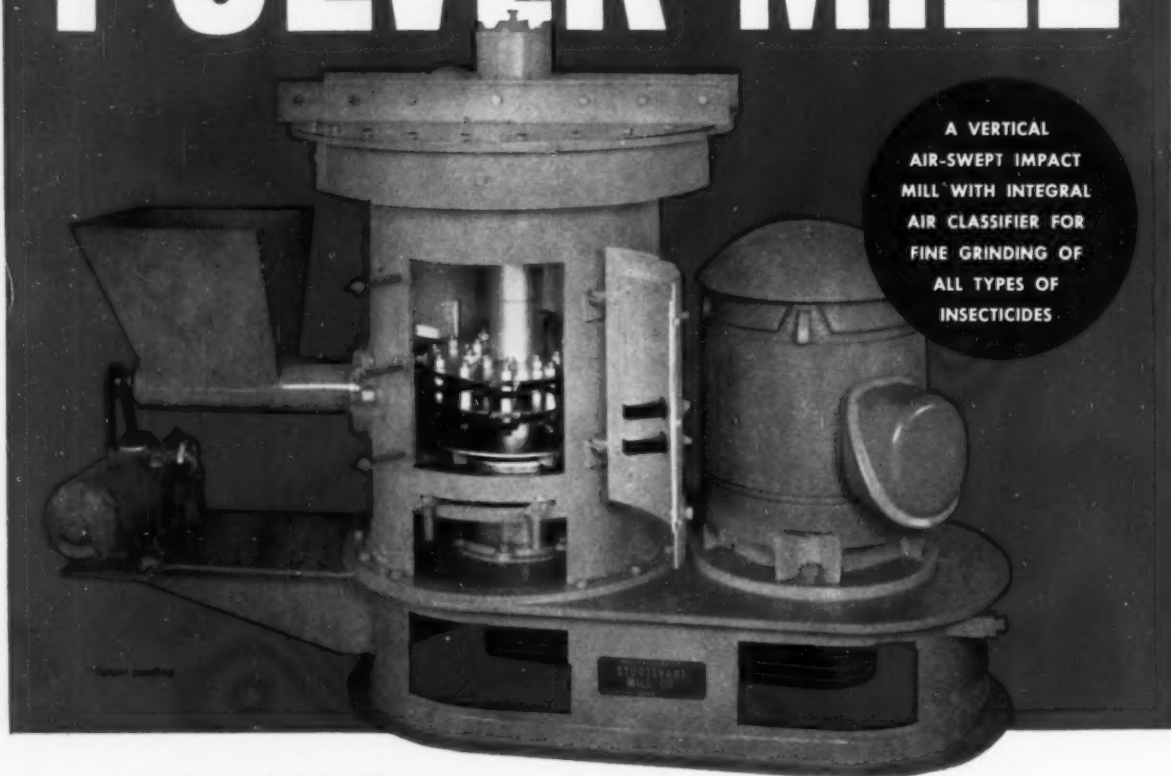
**CHASE BAG COMPANY**

355 Lexington Avenue—New York 17, N. Y.  
32 Plants and Sales Offices Coast to Coast

MULTIWALLS • TEXTILE • PLASTIC AND LAMINATED BAGS • CONSUMER-SIZE PAPER BAGS  
AND OTHER PACKAGING MATERIALS

# ATTENTION: Insecticide Formulators

## *the New* STURTEVANT **PULVER-MILL**



A VERTICAL  
AIR-SWEPT IMPACT  
MILL WITH INTEGRAL  
AIR CLASSIFIER FOR  
FINE GRINDING OF  
ALL TYPES OF  
INSECTICIDES

### **DOUBLE IMPACT GRINDING**

Revolving impactors pass between fixed wall impactors to substantially increase grinding efficiency.

### **DEFLECTOR WALL CONSTRUCTION**

Exclusive Deflector Wall design "bounces" partially ground material back into the grinding zone — speeds grinding process.

### **ADJUSTABLE AIR CLASSIFICATION**

Special intake vane design "whirls" vertical air flow. Adjustable selector bar system provides precise end-product selection.

*Write for full information. Request Bulletin 094.*

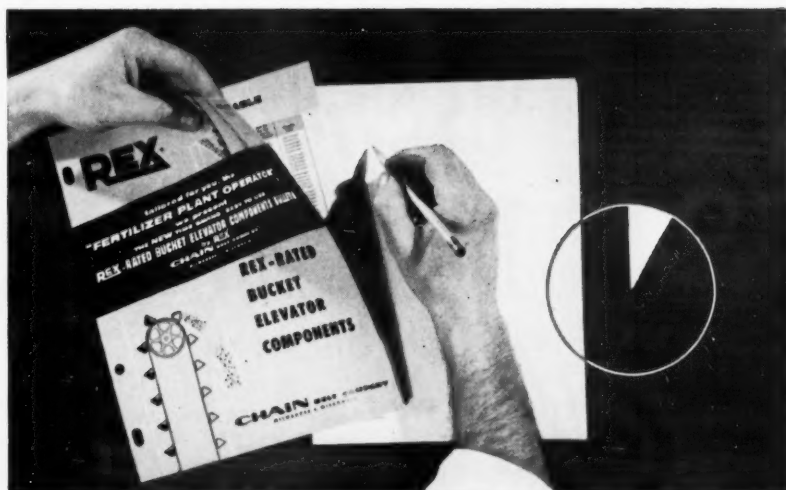
CRUSHERS  
GRINDERS  
MICRON-GRINDERS  
SEPARATORS

**STURTEVANT**  
**MILL COMPANY**  
153 Clayton St., Boston 22, Mass.

BLENDERS  
GRANULATORS  
CONVEYORS  
ELEVATORS

COMMERCIAL FERTILIZER

**NOW  
SELECT  
BUCKET  
ELEVATOR  
COMPONENTS  
IN  
LESS  
THAN  
FIVE  
MINUTES**



**New Rex Selection Tables condense 70 years' experience into a simple 5-minute guide**

Here's the fertilizer industry's quickest, simplest way to select the correct components for your bucket elevators.

It's not only fast—it's accurate; it's easy! In a few simple steps it leads you to the equipment that will meet your specific service requirements most economically: chains, buckets, sprockets, bearings and take-ups.

All you have to know are the type of material you are handling and your required volume and lifting height. You just feed this basic information into the Rex Selection Tables. Here your requirements are fully analyzed—and out come your selections, clear and correct.

Rex Selection Tables are contained in the new Rex Rated Bucket Elevator Components Bulletin No. 6057. Send for your free copy today.

---

CHAIN Belt Company, 4706 W. Greenfield Ave., Milwaukee 1, Wis. (In Canada: Rex Chainbelt (Canada) Ltd., Toronto and Montreal)

**REX®**

CHAIN BELT COMPANY

Please send my free copy of the Rex Rated Bucket Elevator Components Bulletin No. 6057, containing the Rex Selection Tables for selecting elevator components.

Name \_\_\_\_\_ Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

# New 1100 TPD Concentrated Complete Fertilizer Granulation Plant

*Designed by*  
**DORR-OLIVER**  
*for Imperial Chemical  
Industries Limited*

The more than 40-year-old experience of the Dorr-Oliver organization in designing or equipping nearly 50 fertilizer projects in 17 countries has been utilized in another spectacular development—the largest C.C.F. granulation plant in the British Commonwealth and one of the largest in the world.

The plant is the latest addition to the immense 1100-acre chemical complex operated by Imperial Chemical Industries Limited at Billingham, England. Sulphate of ammonia, monoammonium phosphate and muriate of potash are combined by the Dorrco Granular Fertilizer Process to form a concentrated complete 12-12-18 fertilizer. Two processing units produce a total of 1100 tons per day. Advanced design and extensive use of instrumentation results in high productivity with a relatively small labor force.

If you are interested in the field of fertilizer production, call for a preliminary discussion, or write for information to Dorr-Oliver Incorporated, Stamford, Connecticut.

The services of Dorr-Oliver cover all phases of fertilizer plant design, from economic analysis to supervision of initial operation.



Dorrco—T.M. Reg. U.S. Pat. Off.



# A BAGFUL OF WAYS TO BOOST HI-D® SALES

**IN '61**

The idea of Hi-D is catching on. More farmers, more ranchers, more growers are using ammonium nitrate in granular form—using Hi-D as a supplement to your mixed fertilizers. Read how CSC is spreading the news about Hi-D and backing up your own sales efforts throughout '61.

**MAGAZINES** feature these informative ads, explaining the many advantages of Hi-D.

In full color in *Progressive Farmer*, *Farm & Ranch* and *Successful Farming*.

And in black and white in *Florida Grower & Rancher*, *Prairie Farmer*, *Citrus & Vegetable Grower* and *Rice Journal*.

**TV SPOTS** on farm programs of 18 stations demonstrate the free-flowing action of Hi-D.

**RADIO SPOTS** on 75 stations are a frequent nudge to farmer's memory.

**BILLBOARDS** in 879 high-traffic locations throughout South and Midwest enlarge 'Mighty Good Eating' theme.

**OUTSIDE THE STORE** Attractive metal sign and Hi-D clock-type thermometer (attention guaranteed!) bring the Hi-D buyer to your store.

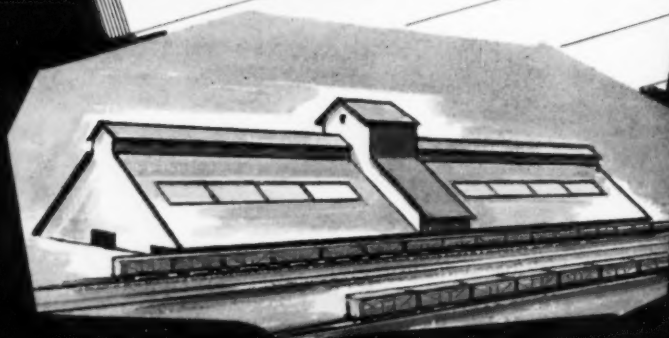
**INSIDE THE STORE** Window streamers echo theme of 'Mighty Good Eating'; packages of samples, product folder and counter displays keep customers thinking Hi-D.

**CSC**

# ONE BASIC SOURCE FOR FERTILIZER CHEMICALS

*Reminder—  
Order from Tennessee*

*Copper Sulfate  
Iron Sulfate  
Zinc Sulfate  
Manganese Sulfate  
Manganous Oxide  
Mineral Mixtures*



For more than thirty years we have produced trace elements for the fertilizer industry.

## GET THESE PLUS FACTORS—

Cut cost with combined carload lots from One Basic Source or save time, plant space and labor by using our Custom Formulated Mixtures—We will furnish you combinations of minerals mixed to your particular specifications.

## Foliar Nutritional Products—

Iron, Zinc and Manganese Compounds—Nu-Iron, Nu-Z, Nu-Manese and Es-Min-El (a foliar applied mineral mixture).

For further information, phone, wire or write —



**TENNESSEE CORPORATION**

APT. BUILDING, ATLANTA - GEORGIA

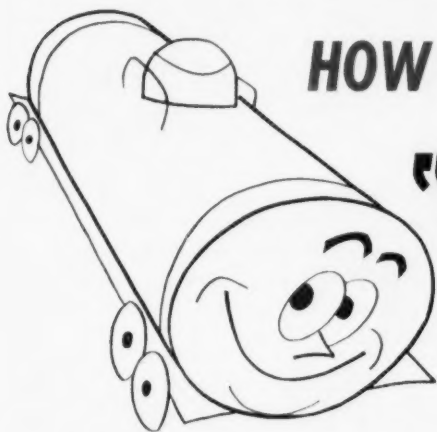


# Arcadian® News

Volume 6

Nitrogen Division, Allied Chemical Corporation

Number 3



HOW YOU CAN HELP TO...

**"GET ME TO YOUR  
PLANT ON TIME!"**

**This tank car** makes an important point—*extra* important to you now that the rush season is here! As you know, Nitrogen Division produces a full range of nitrogen solutions in ample volume at strategic locations—more than enough to meet normal and peak demands. Moreover, the tank car fleet to transport this production is large enough to handle just about every situation. However, through combinations of circumstances, such as bad weather and emergency orders, it sometimes happens that tank cars are unavailable when wanted, and shipments are delayed. While no one can do anything to alter these circumstances, mixed goods producers *can* take that most important preventive measure: *fast turn-around* of tank cars. Or, as our little tank car character would say:

**"GOTTA  
GET BACK  
FAST"**



**Everyone benefits** where there is fast turn-around at both ends of the track. Nitrogen Division, as producer, can coordinate production and shipment better; while you, as consumer, can handle your peak demands more

efficiently. But it's obvious that a tank car shortage hits mixed fertilizer producers hardest. That's why you should resolve to return tank cars as fast as possible.



**"CAN'T DELIVER WHEN I'M IDLE"**

**Remember**, a tank car sitting idle on your siding—or anyone else's—can't also be back at the Nitrogen Division plant, taking on that rush order you just placed!



**"HOW TO  
KEEP ME  
MOVING"**

**Here are six** practical suggestions, gathered from a wide range of fertilizer plants throughout the U.S., that

can help speed up turn-around of tank cars—and contribute to smoother operations in your plant, in the bargain.

**1 "KEEP ACCURATE RECORDS"**



An accurate, running record of withdrawals from tank cars should be maintained at all times. This accomplishes the two-fold purpose of helping to control fertilizer analysis, and determining the instant a car is actually empty.

**2**



**"KEEP AIR PRESSURE UP"**

Where a tank car is to be unloaded into a storage tank, maintain enough air pressure to make the transfer quickly. Check piping, pressure gauges, pressure governors, safety devices, and all other equipment for any bottlenecks or malfunctioning. Stay within the limits of permissible working pressures on tank cars and storage tanks. When some pressure relief valves operate, they may drop the pressure below a satisfactory working level, and valuable time can be lost while pressure is being rebuilt.

**3 "WATCH THOSE CENTRIFUGAL PUMPS"**



If centrifugal pumps are used to transfer nitrogen solutions to storage, be sure to operate at the minimum practical pressure at the pump's discharge side. This type of pump delivers a great volume at low discharge pressures, but volume drops off rapidly as the pressure increases. For example, in many conventional centrifugal pumps, delivery volume actually drops to zero at fairly moderate discharge pressures.

**4**

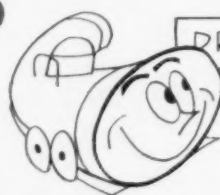


**"MIX HIGH 'N' GRADES FIRST"**

Where conditions permit, operators can empty tank cars faster by giving production priority to those grades

which use up solutions rapidly. These include grades that consume large amounts of nitrogen solutions per ton; and those which use moderate amounts, but are mixed quite quickly. Another suggestion would be to have the simpler formulas mixed by less skilled work shifts, such as the night crew, rather than let the tank car sit idle very long waiting for a highly trained crew to start on a complicated mix.

**5**

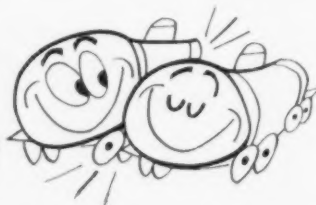


**"AIM FOR THE NEXT PICK-UP"**

If it can be arranged, it pays to push production a little beyond normal operating pace or hours, in order to empty a car for the next railroad pickup. Where this gets a car rolling over a week-end—so much the better! Your tracks are freed for action, and the possibility of any "sitting out" problem is avoided.

**IMPORTANT!** Mail your car release notice promptly, so that Nitrogen Division can expedite the return of the car.

**6 "SOMETIMES TEAMWORK'S BETTER"**



Some operators will, on occasion, empty out two cars simultaneously to prevent any interruptions in production that might delay workmen. Of course, care must be taken to see that solution does not pass from one car into the other, as this would disturb the accuracy of a running inventory, thus making it impossible to predict when either car will be emptied. As one might expect, there are certain safety hazards in multiple hook-ups, but since these are quite obvious, multiple discharge can be made as safe a procedure as the single car method.

You, yourself, with a little thought on the subject, could undoubtedly come up with more suggestions for effecting fast turn-around of tank cars. If you would like to discuss these with us... or get more information on any aspect of the transportation and use of nitrogen solutions, contact Technical Service, Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y.

## HOW TO MAKE SURE A SOLUTIONS TANK CAR IS COMPLETELY EMPTY

**Failure** to completely unload all of the nitrogen solutions from a tank car before returning the car to the nitrogen producer can result in serious difficulties for the fertilizer manufacturer.

Even when the fertilizer produced is up to grade, the cost of returning much solution is some times painful and often leads to controversy. The consequences are critical if the solution left in the car is related to under-proportioning, because the error may not come to light until the customer is informed through the routine check of the nitrogen producer.

Failure to use all the solution in the car may result in the production of large amounts of off-grade fertilizer, as well as the closely associated trouble of over-proportioning. In over-proportioning, the accumulation of shortages may cause a shocking predicament, if a running inventory is not used conscientiously. This is especially true when the solution goes through a storage tank.

Some operators show uncanny accuracy in predicting the point at which the tank car will be empty, whether working direct to process or to a tank. This is usually the result of highly-developed operating skills. These men know how many tons should be processed from each tank car or how long it takes to transfer the contents under certain working conditions. They strive for performance within one-half of 1% of mathematical perfection. They know that errors of 1% are cause for concern, especially when the car seems to be empty or is actually empty.

*Usually the failure to empty the tank car is due to too little AIR pressure.*

Experience may show that 30 pounds gauge pressure per square inch is required, when the tank car is full, to operate at a desired rate. When the tank car arrives, pressure is practically all vapor pressure from ammonia with very little from air. High pressure on arrival may be desirable but it is also deceptive because it is often at, or above, the pressure required for operation. It pays to depend on AIR pressure to get the desired results, rather than ammonia pressure. It is important to have the correct air pressure on the car at all times until it is completely empty.

Very little air pressure may be required to start an adequate flow and some operators see no reason for maintaining much more than this minimum pressure for the entire operation. That's why some cars are returned to nitrogen producers nearly full of solutions, and many half full.

One reason for inadequate air pressure is a limited volume of compressed air. Measuring tanks have a notorious appetite for compressed air, especially when it is necessary to vent off the air to refill them, which is often the case when handling large quantities of solution.

This problem can be avoided by having a measuring tank large enough to provide a "cushion" over the full charge of solution. Another "cushion" can be a separate pressure-safe aluminum or stainless steel tank above the measuring tank, connected with large equalizing pipes and the usual safety devices.

Frequent inspection and easy flushing with water is advised for both tanks. Increased air space may not be a satisfactory answer for the highest vapor pressures. Economy of air here would be in the opposite direction—by using small measuring tanks.

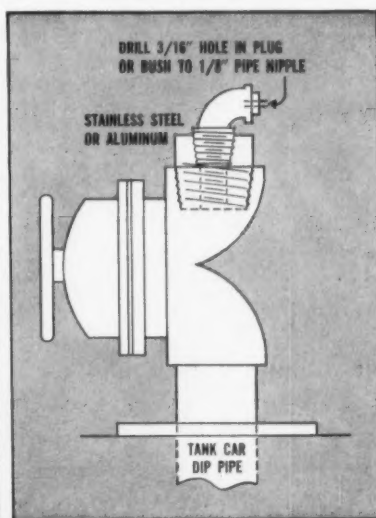
Faulty pressure gauges, absence of any gauge, or improperly placed gauges are other causes for error. But the most common error is the failure to maintain a little MORE air pressure on the car

after three-fourths of the solution is removed, right down until the last gallon is removed. Many operators knowingly permit the pressure to decline at this point for reasons that are hard to understand.

A full car has about 3½ pounds more pressure on the solution at the bottom than at the top where the pressure is read. Each two feet of height exerts a pressure of about one pound per square inch. Under a uniform but narrow enough margin of air pressure, the pressure on the solution at the bottom when a low level is reached will be reduced enough that some ammonia will boil out of the nitrogen solution. This level has been as high as the middle of the car and is all too often at the quarter-full level.

During operation this gas volume sometimes creates the same noises, jerking movements of the hose, bubbles in gauge glasses and sight flow indicators and meters, as are created by the rush of air at the instant the car does in fact become empty. There is no easy way of determining whether the emptying symptoms are caused by air or by ammonia gas, if the air pressure is at a questionable point.

The importance of maintaining accurate running records readily available to the operator cannot be over-emphasized. Accurate pressure gauges, to be read only while there is no movement of air or gas past them, are very necessary.



The device shown above is a valve for checking to determine whether a solution tank car is completely empty. The dip pipe goes all the way to the bottom of the inside of the tank car.

### Follow this procedure:

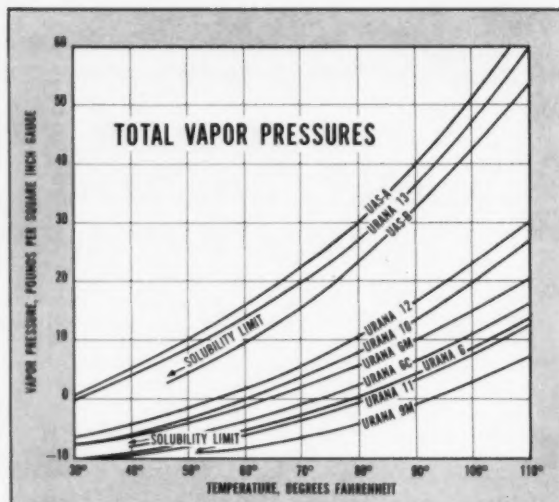
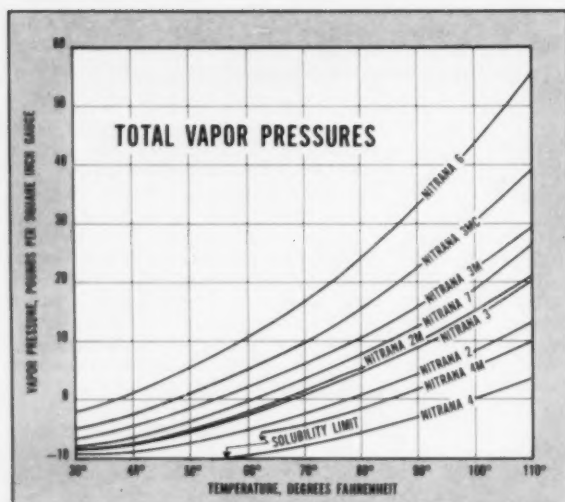
Consult record of car to determine whether it should be empty. Have pressure in car at least 10 pounds above the solution's vapor pressure at its tempera-

ture. Observe all pressure limitations and safety practices. See pressure-temperature curve for the particular nitrogen solution.

Open the valve (shown at left) only enough to produce full flow of liquid or gas through the 3/16-inch hole in plug or the 1/8-inch nipple. After 30 seconds, open valve one more full turn to apply full pressure. If full liquid stream flows for the next minute, the car is probably not empty. Consider influence of any liquid drained to car from piping or measuring tank. If air or gas flows freely for the next minute, with pressure as suggested, the car is probably empty.

**Note:** To avoid removing the solution hose, for the checking, install "T" with a valve ahead of the solution hose. Close this valve while checking to prevent influence of back pressure. Use a small valve on the small test piping. If small hose or much piping is used on test equipment, locate restriction at loose end to insure full pressure being applied at visual observation point.

These suggestions are offered with the belief that they will be helpful to the operator. Because of the many different conditions in fertilizer plants, Nitrogen Division, Allied Chemical Corporation, does not guarantee results from these suggestions.



When the car is three-fourths empty, there seems to be an irresistible temptation to "coast" or use the existing pressure in the car to finish it without adding more air. When sufficient AIR pressure exists at this point no bad results are experienced but the practice gets the operator in trouble eventually.

Sometimes many hours are lost while sufficient air pressure is rebuilt to resume operations. Sometimes much nitrogen solution is returned in the car. Realistically near the end of the car—about 5 pounds more air pressure should be added above the minimum necessary for the full car to compensate for the loss in static head of the liquid to hold the ammonia in solution and out of trouble. Always respect safe practices in general and watch the safety valve settings.

To be entirely free of any concern over pressures that result in return of ammoniating solutions in tank cars, it would be necessary to operate with solutions that have no more than zero gauge pressures. This would lead to some very unsatisfactory ammoniating solutions. Another alternative would be the im-

practical one of using the existing solutions at temperatures that would naturally provide zero gauge pressures. The temperature-pressure relation tables show that the following temperatures would meet this condition: NITRANA® 6—lower than 38°F... NITRANA 3MC—lower than 48°F... NITRANA 3 and 2M—lower than 68°F... and URANA® 12—lower than 55°F... and U-A-S®—A and B—lower than 30°F.

The more practical way is to understand what causes the trouble and use the correct solution to meet your requirements.

*Here are some reasons why the car may be thought to be empty:*

In measuring tanks the vent, that releases air so the tank can be recharged, sometimes becomes plugged. This stops the inflow at some short point.

Where the top or the bottom connections of gauge glasses become plugged, the actual flow into the measuring tank is not indicated in the gauge glasses.

Meters may become jammed or the holes in the distributor pipe plugged so no liquid can flow through the meter.

Pressure gauges may be faulty in themselves or poorly placed to lead to wrong conclusions. There may be too little air while the gauge shows ample pressure.

If pumps are used instead of air pressure, they can easily become vapor-locked from ammonia gas and all flow will cease.

Only slightly above normal operating pressures, some centrifugal pumps will abruptly cease to deliver any volume.

In hot weather or in changing to a nitrogen solution which has high vapor pressure, the possibilities of some of the foregoing problems arising are increased.

In extreme cases enough nitrogen salts will be precipitated in cold weather from some nitrogen solutions to plug the system and erroneously indicate that the car is empty.

*If you have any questions on the proper handling of nitrogen solutions, contact Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y. Technical advice and assistance are available to customers without charge.*

## ARCADIAN® NITROGEN SOLUTIONS for Fertilizer Manufacturers

### NITRANA® • URANA® • DURANA® • U-A-S® • ANHYDROUS AMMONIA

Other ARCADIAN® Products: URAN® and FERAN® Solutions • Ammonia Liquor • N-dure®  
A-N-L® • Ammonium Nitrate • UREA 45 • Nitrate of Soda • Sulphate of Ammonia

**When you** purchase your nitrogen requirements from Nitrogen Division, Allied Chemical, you have many different nitrogen solutions from which to select those best suited to your ammoniation methods and equipment. You are served by America's leading producer of the most complete line of nitrogen prod-

ucts on the market. You get formulation assistance and technical help on manufacturing problems from the Nitrogen Division technical service staff. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions.

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# Midwest

## INDUSTRY-AGRONOMIST

# Meeting

The big, busy Midwest meeting of the fertilizer industry with college agronomists was held February 16-17 at Chicago. The thirteenth annual session, sponsored by National Plant Food Institute, again attracted around 700 people, who heard reports on crop and soil programs in Ohio, Wisconsin, Iowa and Kansas, plus three other speakers on a variety of related topics.

M. B. Russell, head of the Agronomy Department at the University of Illinois, and chairman of the Midwest Agronomists, presided at the first day's meeting, and appeared again on the following day to present the agronomists' grade and ratio recommendations for the re-

gion (see page 31).

R. L. Cook, head of the Department of Soil Science at Michigan State University and co-chairman of the agronomists' meeting, presided the second day.

Zenas H. Beers, Midwest regional director of NPFI, welcomed the audience at the opening of the initial session.

Alan K. Kindle, chairman of the Advisory Group on Merchandising the Institute's program, was the lead-off speaker with a talk on opportunities for profit. Pointing out that the committee's sole function was to analyze, evaluate and develop ways in which NPFI's selling

aids can be utilized by the membership, he said:

"My four associates on the Committee—all merchandising specialists—share with me an intense conviction that the fertilizer industry has within its grasp opportunities for greater sales and profits if it will recognize them and act upon them.

"These opportunities lie in the stimulation of demand for plant food—based on sound agronomic practice, of course—and then convincing the farmer customer to buy the plant food he needs by using every legitimate tool in the selling kit. This takes enthusiasm, ingenuity, innovation, integrity, wisdom

1. Richard E. Bennett of Farm Fertilizers, Inc., immediate past chairman of National Plant Food Institute's board; J. D. Stewart, Jr., of Federal Chemical Co., current NPFI board chairman; Paul T. Truitt, NPFI president; and John W. Hall of Potash Co. of America, vice chairman of NPFI's board.

2. Among speakers at the February 16 session (left to right): (front row) Dr. Marvin Beatty, University of Wisconsin; Dr. Gordon Ryder, Ohio State University; Dr. John Pesek, Iowa State University; and Dr. L. E. Engelbert, University of Wisconsin; (back row) Dr. Everett Rogers, Ohio State University; Dr. H. R. Albrecht, Pennsylvania State University; and Dr. M. B. Russell of University of Illinois, chairman of

the Midwest agronomists organization.

3. Among fertilizer industry men who took part in a panel discussion during a meeting of the NPFI Midwest Fertilizer Materials Handling Work Group were (left to right): H. H. Tucker, Sohio Chemical Co.; R. L. Balser, Spencer Chemical Co.; Harry L. Cook, Farm Bureau Coop. Assn.; Loren Johnson, U. S. Steel Corp.; R. L. Maxwell, GLF Soil Building Service. Not shown, but participating in the panel was Leonard Schrader, American Oil Co.

4. Douglas R. Graves, Harris Trust & Savings Bank, Chicago; Dr. Floyd W. Smith, Kansas State University, and Dr. H. J. Mederski, Ohio State University, who were among speakers at the February 17 session.



## Midwest Meeting

and hard work, together with a healthy determination to sell benefits—the only thing a customer ever buys . . .

"You are familiar, I'm sure, with the localized county intensified soil fertility programs and demonstrations as well as the state-wide soil testing drives. When executed properly and followed up conscientiously, everyone benefits: the farmer increases personal income, the county extension director increases the number and range of contacts, the community prospers and the fertilizer industry" . . .

"These results really add up to only one fact: proper and adequate fertilization means benefits to the farmer-customer and he can be made aware of this. The intensified soil fertility programs when conducted in your market area offer

several ways in which you can participate directly and share in the results:

1. *Help in the choice of the county. Your advice and opinion are always welcomed by the state agricultural college;*
2. *Provide technical assistance. You and your company have priceless know-how and experience and you ought to throw them into the battle;*
3. *Serve on local committees. It's tough but rewarding work;*
4. *Help in the preparation of promotional and publicity materials. The County Agent and other program leaders can always use your talent;*
5. *Help provide material support: sampling tubes, sample cartons, posters, bumper stickers;*
6. *Tie in through your own sales promotion literature;*

7. *Tie in with your advertising. You can support special fertility issues of the local newspaper and radio and TV spot announcements;*
8. *Sponsor or cooperate in demonstrations;*
9. *Sponsor special events: dinners, square dances and sports events. Bring in a brass band and have a parade;*
10. *Act as soil test information agent and set up soil sample collection stations;*
11. *Take soil samples for your customers and prospects;*
12. *Have your dealers stock recommended grades. How sad it is to have the customer frustrated by not being able to buy your product;*
13. *Follow up on those soil test recommendations and go after the order. That's where your profits lie."*

1. Emerson Jones, Nitrogen Div., Allied Chemical Corp.; A. G. Stevenson, Tri-State Fertilizer Co., and Ike Swisher, Nitrogen Div., Allied Chemical.
2. James C. Britton, U. S. Borax & Chemical Corp., and Dr. Harold Rhoades, Univ. of Nebr.
3. Harry Cook and Ralph W. Hughes, Farm Bureau Coop. Assn.
4. J. V. O'Leary, Northwest Nitro-Chemicals Ltd.; Lyle Barndt, Crystal Chemical Co.; W. H. Green, Northwest Nitro-Chemicals Ltd.; Richard E. Bennett, Farm Fertilizers, Inc.
5. C. E. Austin and J. C. Evans, Smith-Douglass Co., Inc.
6. Douglass R. Graves, Harris Trust & Savings Bank; Dr. S. Aldrich, Univ. of Ill., and Jim Mehn, U. S. Industrial Chemicals Co.
7. John R. Taylor, Jr., John Deere Chemical Co., and H. R. Albrecht,

- Penn. State Univ.
8. Ben McCollum, J. R. Simplot Co., and Dr. Lawrence Fine, S. D. State College; W. P. Dean, Swift & Co.; and Charles F. Martin, Miami Fertilizer Co., Div. of IMC.
9. Malcolm McVickar, Ortho Div., California Chemical Co.; R. P. Thomas, International Minerals & Chemical Corp.; and Leo Ortho Div., California Chemical Co.
10. John R. Guttay, NPFI; A. H. Bowers, Swift & Co.; Arlan Woltemath and Edward Schumann, NPFI.
11. H. B. Mann, American Potash Inst., and John W. Hall, Jr., Texas Gulf Sulphur Co.
12. Dr. C. T. Webster, Univ. of Ky.; Laurie Peterson, Midland Coop.; and Howard L. Peterson, Lincoln Service & Supply.



## Albrecht

American agriculture's productive power stands as perhaps the greatest deterrent to aggression against the Western World, Herbert R. Albrecht, director of Extension, University of Pennsylvania, declared. "Certainly the Soviet can match us if not surpass us militarily on land, or sea, in the air—and in space."

Dr. Albrecht said that the Cooperative Agricultural and Home Economics Extension Service in teamwork with the Experiment Station system, has "put knowledge to work on American farms . . . It has lifted from our people the fear of starvation even during the bleakest days of world conflict."

In contrast, he noted the recent political unrest in Russia because of the failure of farms to reach production goals.

Modern day leadership in Extension

has gone to long ends to position the service into an agency of leadership in the 1960's, Dr. Albrecht said. "The Cooperative Extension Service has begun to set the pace for adjustments within our Colleges of Agriculture, which will provide us with the blueprints of our progress in the future."

County workers and specialists alike have come to appreciate the need for broadly based programs which many times will be serviced by a combination of agencies, private as well as public, he reported.

"The programs will emphasize advance management procedures, new departures in marketing, consumer education, public affairs and responsibilities, family living, community developments," he said.

He cited developments in Pennsylvania as an example of how the "New Look in Extension" operates.

"All who are concerned with the creation of a stable agriculture—and I certainly include industry—must work to determine not only the 'expressed needs of the people' but the unexpressed needs as well," he pointed out. "For here may lie those basic elements which might lead to the solution of some of agriculture's most pressing problems."

Dr. Albrecht reported that a pilot soil testing project in Columbia County, Pennsylvania, supported in part by the National Plant Food Institute, yielded as many soil samples in its first three months of operation as the county had submitted to the Laboratory in the past four years.

"Experience gained from the Columbia County project has been used in the establishment of similar projects in other counties," he said. "These efforts are leading to a more

1. Dr. Werner Nelson, American Potash Inst.; Leonard L. Schrader, American Oil Co.; and Ward Calland, Natl. Soybean Crop Imp. Assn.
2. Dr. Ralph Young, N. D. Agricultural College, and Dr. John T. Pesek, Ia. State Univ.
3. Paul T. Truitt and Zenas H. Beers, National Plant Food Institute.
4. J. A. Heineck and Joe Whittington, Olin Mathieson Chemical Corp. and Frank Nelson, Rath Packing Co.
5. R. A. Garn, Central Farmers Fertilizer Co., and Merle Blue, Consumers Coop. Assn.

6. R. P. Koos, Kenosha, Wisc., and Cash Cahill, F. S. Royster Guano Co.
7. Ray White, Spencer Chemical Co.; Ben McCollum, J. R. Simplot Co.; Joe Sharp, Spencer Chemical Co.
8. Luke Funk, Commercial Solvents, and Lee Hays, Chemlizer Corp.
9. J. D. Stewart, Jr., Federal Chemical Co. Div. of National Distillers & Chemical; Dr. George Scarseth, American Farm Research Assn. and John Zigler, International Minerals & Chemical Corp.
10. C. L. W. Swanson, Texaco Inc.; M. P. Kernkamp and W. P. Martin, Univ. of Minn.; and R. W. Scanlan, Phillips Petroleum Co.
12. Leo Dohoe, Smith-Douglass Co., and Jim Schell, Kingsbury & Co.



## Midwest Meeting

orderly and stepped-up interest in the wise use of fertilizer and limestone.

### Wisconsin

An increasing number of Iowa farmers on nearly level soils can be expected to adopt continuous corn growing, according to John T. Pesek, Iowa State University agronomist.

Yields of continuous corn have averaged about as high as rotation corn in tests at six University farms over the past six years, Dr. Pesek reported. Average yields at the six locations were 91 bushels per acre for rotation corn and 90 bushels for continuous corn.

In another experiment at the agronomy farm near Ames, one set of plots has been in continuous corn since 1915. When adequate fertilization was applied, beginning in 1952, yields on these continuous corn plots shot up to levels as high as the rotation corn, he said.

Average corn yields increased from 29 to 96 bushels per acre in the 1953-60 period, from the use of 160 pounds of nitrogen and 60 pounds each of  $P_2O_5$  and  $K_2O$ , he stated. Eighty pounds of nitrogen with the phosphate and potash gave 82 bushels. But the same amount of nitrogen without the other two nutrients yielded only 74 bushels.

"Most of the work with continuous corn has been on more or less level areas of medium-textured soils," Dr. Pesek said. "Continuous cropping to corn should not now be attempted on moderate-to-steep sloping areas of more than 5 per cent slope. It is not feasible to control erosion with commonly used cultivation practices."

He estimated that about 15 million acres of Iowa farm land is in the 0-1 per cent and 2-4 per cent classes. This, he says, represents the maximum present estimate of all cultivated land which might go into intensive intertilled row crop production.

Discussing fertilizer needs, Dr. Pesek said: "The main feature of fertilizer needs for continuous corn is additional nitrogen. Our most recent estimates show that about 80-120 pounds per acre annually would be needed if corn were grown continuously on soils of average fertility. Subsequent work suggests that this may be somewhat of an overestimate for the state as a whole. First year corn following a legume requires little or no fertilizer nitrogen."

Once the basic fertility needs of a corn field have been met, about 30 to 40 pounds of  $P_2O_5$  and  $K_2O$  per acre would be needed annually for optimum yields, he indicated.

"With new high analysis fertilizers, this might be put on the row each year to act as a starter," Dr. Pesek said. "Its residues and plant residue would become part of the general soil supply for following years. Particular attention would need to be paid to the pH and to liming where high nitrogen rates are used on some soils."

He said that while many studies under low fertility conditions indicate a decline in soil organic matter and soil structure under intensive cultivation, the rate of decline could be expected to be less when large amounts of organic residues are produced "as in the case of correctly fertilized corn."

Special studies last year on soil in continuous corn on the Southern Iowa Farm, showed that both organic carbon and organic nitrogen were increased more under continuous corn, at 120 and 250 pounds of nitrogen applied annually, than in the rotation.

Regarding moisture, Dr. Pesek said that results of soil moisture studies in dry years indicate more available water in soils previously in corn than in legume meadows. Thus, "continuous corn would tend to reduce the year-to-year variation in corn yields that result from seasonal differences in the rainfall," he said.

Discussing the hazards of growing continuous corn, Dr. Pesek said that while there is no serious plant disease threatening Iowa growers at the present time, continuous corn "invites" a build-up of soil-borne disease and growers will have to remain alert for signs of damage.

Further, he noted that the growing of a single crop tends to concentrate the demand for labor and equipment and to increase the risk of financial loss in case of either a crop failure or a low price for corn.

"On many farms, however, there may be an opportunity to increase the intensity on the more level land, while decreasing the effort and intensity on the more rolling portions of the farm," Dr. Pesek said.

"Such a shift would tend to lower the costs of producing corn and hay and tend to overcome the risks. Total farm product would increase, since the low-yielding oat crop would occur less frequently, if at all."

### Iowa

Maximum returns from fertilizer use in the future will become increasingly dependent on the kind of soils being fertilized, Marvin Beatty, University of Wisconsin extension soils specialist, reported, as intensive management and greater capital investments per acre are enabling farmers to obtain higher and higher yields on most crops.

As the use of land becomes more intensive, the properties of the soil are an increasingly important factor, he pointed out. Only a limited number of soils are capable of giving high yield responses to intensive management.

Dr. Beatty said that maps and reports from soil surveys can show the locations of soils responsive to various intensities of management. These maps can help locate areas having high potential for increased use of fertilizer.

"Good measurements or estimates of yields are a must for a sound farming program," he declared. "If farmers are going to adopt new fertilizers and management practices, they need to know how much it will increase their yields."

He reported that yield measurements and estimates are now being made available to farmers in popular publications and through county agents, soil conservationists and other professional workers.

Fertilizer recommendations based on soil tests he said, "are primary tools for helping farmers make more money from fertilizer, by using it more efficiently."

Discussing the economics of improving crop yields, Dr. Beatty cited a recent study of potential crop and livestock production and net farm income in northwest Wisconsin by two agricultural economists — Drs. John R. Schmidt and Rudolph Christianson.

This study was made to compare the extra money a selected group of farmers might make by improving their crop management, their livestock management, or both, simultaneously. The participating studies were "above average" and were already using substantial amounts of fertilizer.

Results of the study showed that deep loam soils with good moisture storage had a greater potential for increased yields and income than did shallower, sandy soils.

Net income increased an average of \$5,600 from a combination of improved crop and livestock manage-

## Midwest Meeting

ment on farms with the more highly responsive soils than on soils less capable of increasing yields.

"This study indicates clearly that farmers in the 'above-average' category can continue to increase their net income by improved crop and livestock management," Dr. Beatty said. "It indicates, too, there are good long range prospects for increased sales of fertilizer on such farms.

"The study also shows that fertilizer applications and cropping programs should be applied selectively with special emphasis on highly responsive soils."

### Ohio

"On-the-farm" fertilizer trials can convince farmers of the profitable opportunities for plant food use, was the report by two Ohio State University specialists — Gordon J.

Ryder, extension agronomist, and Everett Rogers, agricultural economist.

As an example of how this works, Drs. Ryder and Rogers cited a 42 percent increase in plant food use by Miami County farmers in the year ending June 30, 1960, as a result of a fertilizer demonstration program on corn and meadow crops in 1959 and 1960. This compared with a 3 percent increase for the state of Ohio and an 18 percent rise in neighboring Champaign county, which had been selected as a check county.

Drs. Ryder and Rogers attributed much of the increase in Champaign county to the fact that "the effects of the Miami County demonstrations spilled across county lines."

In discussing results of the Miami County program, they said:

"We found that soil testing is the key step in securing a change in

farmers' attitudes toward fertilizer use. Attitudes do not seem to affect fertilizer use among farmers who test their soils.

"However, there is a strong relationship between attitudes and the use of fertilizer among farmers who do not test their soils. This finding suggests that soil testing may be one method of cancelling out the influence of negative attitudes toward fertilizer."

Fertilizer dealers and salesmen ranked highest as "the most important source of information about fertilizer," in a survey of selected farmers by rural sociologists following the demonstration programs, Drs. Ryder and Rogers reported.

The demonstration program and survey were sponsored by National Plant Food Institute, in cooperation with the Ohio Agricultural Extension Service and Ohio State University's agricultural economics and

1. Zenas H. Beers, NPFI, and Alan K. Kindle, U. S. Steel Corp.
2. Dale Washburn, Farmers Union Central Exch., and Ray Brun, Smith-Douglass Co.
3. Dr. John MacGregor, Univ. of Minn.; Dr. Geo. N. Hoffer, Olin-Mathieson Chemical Corp.; and Dr. Geo. E. Smith, Univ. of Mo.
4. M. B. Russell, Univ. of Ill.; J. B. Peterson, Purdue Univ.; and Kermit Berger, Univ. of Wisc.
5. W. P. Martin, Univ. of Minn.; Richard Balser, Spencer Chemical Co.;

- and J. M. MacGregor, Univ. of Minn.
6. Gordon J. Ryder and Everett M. Rogers, Ohio State Univ.
7. H. R. Albrecht, Penn State Univ.; W. R. Allstetter, NPFI; and L. E. Engelbert, Univ. of Wisc.
8. Dean Keller, Allied Chemical Corp., and Warren Huff, Ashcraft-Wilkinson Co.
9. Wayne Shidaker, Farm Bureau Coop. Assn., and Joseph Lanter, Central Farmers Fertilizer.



## Midwest Meeting

rural sociology department.

Altogether, 57 fertilizer demonstrations on corn and meadow crops were completed in 1959 and 48 in 1960. Eighteen fertilizer companies doing business in Miami County assigned 21 of their salesmen and agronomists to work with the Ohio Extension men and cooperating farmers.

At the beginning of the program, the Ohio Extension Service requested and received sales reports from all companies selling fertilizer in Miami and Champaign Counties.

Ryder and Rogers reported that on the basis of soil test analyses in Miami County and the state of Ohio, Miami County farmers at present are using only 36 percent of the nitrogen, 38 percent of the phosphate and 40 percent of the potash they could apply, if every cropland acre was fertilized according to soil test recommendations.

"For the states of Ohio, conservatively figuring," they said, "farmers are using about 52 percent of the nitrogen, 36 percent of the phosphate and 40 percent of the potash they could profitably apply."

### Banker

The far-reaching scientific and technological revolution in American agriculture has helped double the production efficiency per farm worker in the past 20 years, Douglas R. Graves, assistant vice president for Harris Trust & Savings Bank, Chicago, pointed out. He said "Total U. S. agricultural output has increased two-thirds in the past two decades while the number of farm workers has been reduced by three million."

"One farmer in the U. S. today feeds and clothes himself and 25 others. A generation ago, in 1930, he fed and clothed himself and nine others. A century earlier, he fed and clothed himself and only three others."

Mr. Graves said still greater increases lie ahead as we substitute more capital and technology for labor. Agriculture, he noted, is becoming increasingly dependent for many factors of production, such as fertilizer, feed, machinery and livestock.

"Progress of this kind can be continued only if we have capable and well-informed men on the farm, who are properly financed," he said. "We will need fewer farmers in the future, but they must be better farmers."

Mr. Graves termed the new agriculture as "Agri-business"—a blend-

ing of industry, science, business and education into agriculture and the rural communities.

"In this setting, it is particularly important that we give emphasis to the development of proper credit in the new agriculture," he declared.

The country banker, Mr. Graves said, is well-equipped to provide a coordinated program for financing agriculture. For temporary periods, his own short-term credit resources can be supplemented by his city correspondent bank.

"The suppliers of goods and services have done an excellent job of research and development and have provided the 'tools' faster than the farmer and the banks have been willing to accept them," Mr. Graves continued.

"However, in your efforts to increase sales, many companies have carelessly extended large amounts of book credit to farmers. This has resulted in some farmers becoming overextended and therefore unable to obtain credit from banks.

"If a customer is too poor a credit risk for a bank, or one of the government credit agencies, it is questionable whether a fertilizer dealer should assume this risk, just for the sake of a sale."

Mr. Graves said many fertilizer dealers are giving only a part of the advice and service needed by farmers. "It's time we talked about a balanced fertilizer program, rather than just selling fertilizer," he pointed out.

If agriculture is to progress, there must be developed a system of financing similar to that found in industry, he stated. This type of arrangement will permit farmers to use a line of credit on a revolving basis for year-round financing. Sound planning must be the basis of such credit.

"The fertilizer salesmen can do much to help the farmer obtain this type of credit," Mr. Graves said. "If the salesman will assist the farmer in developing a program within his managerial and financial ability, the banker can be sold.

"You must be ready, willing and able to show the farmer and the banker what fertilizer means to him on his farm—with his soil and management.

"Farming has become big business and farmers are going to have to act like businessmen. This means they are going to need records, not only of income and expense, but rather an analysis of the various parts of their farming business."

## Kansas

Kansas farmers have increased their use ten-fold since the end of World War II, according to Floyd W. Smith, Kansas State University agronomist, who reported that fertilizer use totaled 332,861 tons in the year ending June 30, 1960, compared to 33,200 tons in 1946-47, Smith said.

"At the present time there is no indication that Kansas fertilizer sales have reached their peak," he continued. "As a matter of fact, it is entirely possible that annual fertilizer sales may achieve the 400,000 mark by June 30, 1961."

Dr. Smith said wheat is easily the Number 1 user of fertilizer among Kansas crops. According to 1959 Census of Agriculture figures, more than 46 percent of the total fertilizer used in the state in 1959 was applied to soils producing wheat.

Grain sorghum accounted for about 49,000 tons of fertilizer, compared to 135,600 tons for wheat in 1959.

"Considerable increased acreage has resulted from grain sorghum being substituted for wheat," Dr. Smith pointed out. "The perfection of hybrid sorghum has provided a tremendous assist since 1957."

Dr. Smith said that expansion of irrigation could result in a 50 percent increase in nitrogen use in the next 15 to 20 years. It is estimated that about 2 million acres may be under irrigation by 1975-80.

"Assuming that half of this acreage were devoted to corn or grain sorghum production and also that it was fertilized according to research findings," he said, "the nitrogen consumption on irrigated land might amount to 50,000 tons per year."

Kansas tests indicate a high response by irrigated corn to fertilizer applications, Dr. Smith said. Yield increases of as much as 93.5 bushels per acre were obtained from fertilizer supplying 200 pounds of nitrogen and 40 pounds of potash per acre.

He reported that fertilizer research aids the acceptance of new materials by farmers. He cited ammonium phosphate grades of fertilizer, nitrogen solutions and anhydrous ammonia as examples of how research and education by Kansas State University had encouraged farmers' use of these fertilizers.

Dr. Smith said that high analysis 1C-48-0 ammonium phosphate fertilizer is at present in a good position to become the Number 1 grade in Kansas. Its advent has introduced a new era in Kansas fertilizer sales.

## Midwest Meeting

### Ohio

A shift in farm land use toward a greater percentage of high income cash crops such as corn and soybeans, particularly on land not subject to severe erosion, was forecast by H. J. Mederski, Ohio State University agronomist.

"Less land in Ohio will be devoted to the low income crops, with the possible entire elimination of such crops from the rotation," Dr. Mederski said.

He said the availability of relatively low cost nitrogen fertilizer "has to some extent freed farmer from the necessity of growing legumes as a source of nitrogen and provided greater flexibility in the design of the cropping system."

Potentials are high for increasing corn profits per acre when the crop is grown for two or more years in succession, as fewer legumes and more high income crops are included in the rotation, he said.

Ohio tests showed that corn yields were increased 30 bushels per acre

in 1958 and 24 bushels in 1959, respectively, when 150 pounds of nitrogen was applied to corn following corn or grain on soils well supplied with phosphate and potash, Dr. Mederski said. Yields increased 13 bushels per acre in 1958 on corn following legume grass, and 6 bushels in 1959.

A 37-bushel per acre increase was obtained on second and third year corn from additional nitrogen in 1959, he reported.

During the tests, questionnaires were sent to each operator, asking him to describe his usual fertilizer practice. A summary of replies showed that farmers growing corn after a non-legume were applying an average of 30 pounds per acre of supplemental nitrogen.

"This is insufficient for best yields," Dr. Mederski said. "On the other hand, these same farmers appear to be applying adequate amounts of phosphate and potash. Apparently, the farmer is not conscious of the need for an increased amount of nitrogen when corn fol-

lows corn or a non-legume."

He said the Ohio Department of Agronomy has embarked on a large scale research program to evaluate the performance of high income crop sequences using supplemental nitrogen in the absence of legumes or grass sods traditionally considered essential to the maintenance of soil fertility.

"There is every reason to believe that on many soils, high value cash crops will displace the relatively low value sod crops," he said. "With this change, the need for fertilizer nitrogen will increase."

Dr. Mederski reported a sizeable percentage of Ohio's 3.3 million corn acreage is in continuous corn. This ranges from a high of 26 percent in northwest Ohio to a low of 5 percent in southwest Ohio. The percent of corn following corn either continuously or in the rotation, ranges from 25 percent to 30 percent in western Ohio and 5 to 15 percent in the eastern half of the state.

—END—

1. Eugene German, Duval Sulphur & Potash Co., Houston; Phil Stocker, Land O' Lakes Creameries, Minneapolis; Bob Ashcraft and Mercer Rowe, Ashcraft-Wilkinson Co., Atlanta.

2. George Bird, Bird Agricultural Chemical Co., Greenville, Mich., and Elwood Copeland, Klein Fertilizer, Fowlerville, Mich.

3. Gordon Cunningham, Tennessee Corp., Atlanta, and H. B. Mann, American Potash Institute, Washington.

4. Bill Sample, U. S. Testing Co., Memphis, and George Smith, Univ. of Missouri, Columbia.

5. Woody Wilson, U. S. Borax & Chemical Corp., Chicago, and Jerry Lyons, Steve Turner Plant Foods, Pontiac, Ill.

6. Tony Horehled, Sinclair Petrochemicals, Chicago; Leo Orth, California Chemical, Ortho Div., Chicago; and Ernie Harper, Ayco Chemical Corp., Sullivan, Ill.

7. George Failes, Farmers Union Central Exchange, St. Paul, and Chuck Trunkey, U. S. Industrial Chemicals, Chicago.

8. Ray Yates, Ashcraft-Wilkinson Co., Atlanta, and Bill Richardson, Swift & Co., Calumet City, Ill.

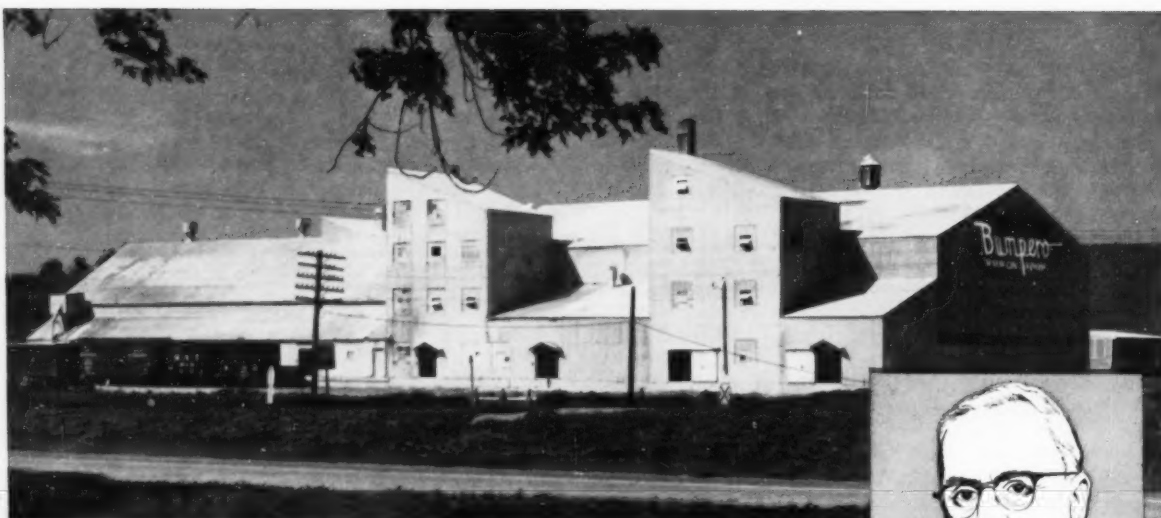
9. Ike Swisher, Allied Chemical, Nitrogen Div., Indianapolis; and R. W. Edwards, Dave Edwards and Joe Hamilton, Monco Liquid Fertilizer, Monmouth, Ill.

10. Eddie Crouse, C. D. Liquid Fertilizer Corp., Liberty, Ind.; Bob Freske, Michiana Chemical Co., Niles, Mich.; Ralph Boynton, U. S. Borax & Chemical Corp., New York; and George Wickstrom, American Potash Institute, Columbia, Mo.

11. A. C. Norris, V. W. Norris & Son, Rushville, Ind., and Bill Morgan, Hydrocarbon Products, New York.

12. Joe Tuning, Spencer Chemical Co., Kansas City, and W. R. Burgess, J. R. Simplot Co., Greeley, Colo.





The home of Bumparo brand pelletized mixed fertilizers is this large plant at South Omaha, Nebraska. This modern manufacturing facility of Farm Fertilizers, Inc., serves customers in Nebraska, Iowa and Kansas.

**Richard E. Bennett**  
President  
Farm Fertilizers, Inc.



## Pace-Setting Midwest Fertilizer Manufacturer Relies On SPENSOL GREEN\* Solutions:

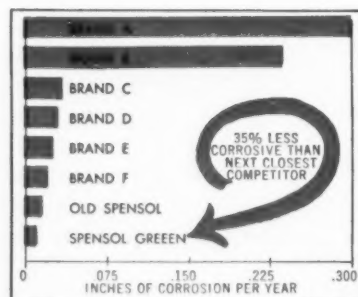
A pace-setter in their area, Farm Fertilizers, Inc., of South Omaha, Nebraska, has introduced several manufacturing "firsts" to the Midwest's fertilizer industry. In 1950, two years after beginning production, this progressive firm became one of the first plants to granulate in the Midwest. More recently, they led others in utilizing pre-neutralization to produce high-analysis, inverted ratios.

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## North Central Region proposes policy

### for uniform labeling of plant foods

At a meeting, February 14, in Chicago, which was attended by agronomists and state control officials from each of the thirteen states—and by representatives of the fertilizer industry, as guests—a uniform policy for the labeling of plant foods in the North Central Region was discussed and agreed upon by the state officials and state agronomists. It is intended that the plan be ratified by each of the states and that appropriate regulations or other action under the state laws will be pursued to bring the plan into effect in all states on July 1, 1961, or as soon as possible thereafter. The uniform policy includes the following points.

1. State officials will require guarantees at minimum levels, in percentages, of all available nutrient elements for which claims of beneficial effects to plants are made in

any form or manner. The fifteen elements and the minimum amount of each which may be guaranteed in the labeling of any plant food product are as follows:

	Percent	ppm
PRIMARY		
N	1.00	10,000
P	0.40	4,000
K	0.8	8,000
SECONDARY		
Ca	1.00	10,000
Mg	0.50	5,000
S	0.50	5,000
TRACE		
B	0.01	100
Cu	0.01	100
Zn	0.02	200
Mn	0.05	500
Fe	0.10	1,000
Mo	0.001	10
Co	0.001	10
Cl	0.10	1,000
Na	0.10	1,000

An element is considered "available" if the form in which it is added to the product has been shown to give plant responses or if the element can be dissolved from the product in water or in some other

solvent which is recognized to indicate availability to plants.

2. Each of the fifteen elements, when claimed, is to be guaranteed in the form of the element, except phosphorus and potassium which are to be guaranteed as the element or as the oxide or both. A statement of the equivalent guarantees for phosphorus and potassium as the elements is to be encouraged, but not required.

3. Warning statements are to be required on the label for plant food products which contain more than .025% boron in a water-soluble form.

4. The use of such all-inclusive terms as "balanced" and "complete" in the labeling of plant food products is not to be permitted unless the label shows the intended meaning of the term.

### State agronomists' suggested minimum fertilizer grade needs of the Middle West for the year beginning July 1, 1961\*

RATIO	Illinois	Indiana	Iowa	Kansas	Kentucky	Michigan	Minnesota	Missouri	Nebraska	N. Dakota	Ohio	S. Dakota	Wisconsin
0:1:4													0-10-40
0:1:3	0-10-30	0-10-30				0-10-30	0-10-30	0-10-30			0-10-30		0-10-30
0:1:2	0-10-20	0-10-20	0-15-30		0-10-20	0-10-20							
0:1:1	0-20-20	0-20-20	0-20-20	0-20-20	0-20-20	0-20-20	0-20-20	0-20-20			0-20-20		0-20-20
0:2:1	0-20-10	0-20-10	0-20-10			0-20-10	0-20-10				0-20-10		0-30-15
1:6:3						4-24-12		4-24-12					
1:4:1					4-16-48	5-20-5							
1:4:4	4-16-16	5-20-20	5-20-20	5-20-20	4-16-16	4-16-16	5-20-20	5-20-20	5-20-20		5-20-20		5-20-20
1:4:2	6-24-12	6-24-12	5-20-10			5-20-10	6-24-12		5-20-10	8-32-16	6-24-12	6-24-12	6-24-12
1:3:9	3-9-27	3-9-27				3-9-27	3-9-27	3-9-27					
1:3:2					4-12-8								
1:3:1				8-24-8		8-24-8		8-24-8					
1:2:4			6-12-24			5-10-20	5-10-20						
1:2:3		5-10-15			5-10-15						5-10-15		
1:2:2		8-16-16	8-16-16		5-10-10	8-16-16	8-16-16	8-16-16			8-16-16		8-16-16
1:2:1			10-20-10	10-20-10		10-20-10	10-20-10	12-24-12	10-20-10	12-24-12		10-20-10	
1:1:3					6-6-18								
1:1:1	10-10-10	12-12-12	12-12-12	12-12-12	10-10-10	10-10-10	12-12-12	12-12-12		12-12-12	10-10-10		10-10-10
1:8:0		5-40-0											
1:4:0	8-32-0	8-32-0	8-32-0	8-32-0		8-32-0	8-32-0	8-32-0	8-32-0	9-36-0	8-32-0	6-24-0	
1:2:0	10-20-0		10-20-0	10-20-0		10-20-0	10-20-0	10-20-0	10-20-0	18-36-0		10-20-0	
1:1:0	15-15-0		15-15-0	15-15-0			15-15-0		15-15-0	15-15-0		15-15-0	
1:0:1		15-0-15											
2:1:2						20-10-20							
2:1:1	20-10-10	16-8-8	20-10-10			12-6-6	16-8-8				14-7-7		16-8-8
2:2:1						12-12-6				12-12-6		12-12-6	
1:3:0				13-39-0	8-24-0		8-24-0	8-24-0	8-24-0	13-39-0		8-24-0	
1:2:6						5-10-30	5-10-30					5-10-30	5-10-30
2:1:0			24-12-0				24-12-0		24-12-0	24-12-0		24-12-0	
4:1:2		16-4-8										16-4-8	
2:7:1													10-35-5
2:0:1		24-0-12				24-0-12							
3:1:0				30-10-0					30-10-0			30-10-0	

\* The production of higher grades of the suggested ratios is encouraged. Solutions of similar ratios are equally acceptable.

Following changes in grades and ratios have been suggested for future consideration: 0-1-3 (0-10-30) to 0-1-4 (0-10-40); 1-3-9 (3-9-27) to 1-2-6 (5-10-30) or 1-2-8 (4-8-32).

# Financing

## THE PLANT NUTRIENTS TEAM

by WILLIAM E. MCGUIRK, JR.

Mr. McGuirk is president of W. R. Grace & Company's Davison Chemical Division, which operates fifteen plants in the Eastern and Central states, producing mixed fertilizers and phosphatic fertilizer materials.

This paper was presented before the Plant Nutrients Division of the American Society of Agronomy at their meeting in Chicago last December.

Because your editors feel that Mr. McGuirk is to be commended in his forthright approach to such a critical—and urgent—topic, and that many who were not in his audience at Chicago can benefit from this message, we requested permission to give the article industry-wide distribution in this issue of COMMERCIAL FERTILIZER.

While the text is specifically slanted at the audience of agronomists, its inference to the rest of us is clear.

Close examination of the role of profit in the economy of the United States is becoming ever more frequent. This "agonizing re-appraisal" to borrow a particularly appropriate Churchillian phrase is part and parcel of some very healthy introspection forced upon us by the winds of change blowing not only in Africa, Asia and Latin America, but here in the United States as well. The day when our statesmen could join with industry in advocating export of a strong dose of American laissez-faire capitalism as certain cure for the world's ills is thankfully behind us. If we are to fulfill the promise of our great Western Democracy in its battle with Communist Imperialism we have to realize that our most important commodity for export to the undeveloped nations is a respect for man as an individual and unique creation of the Almighty. Now when our success as a nation is threatened by Communist Materialism we have come to realize that business is not the only business of America, that the only end is not success measured in material terms, in terms of profit.

In one way, and one way alone,

we can mourn the passing of our American variety of laissez-faire capitalism. It provided a naive consensus uniting America in a common front of purposeful economic action that successfully brought about our transformation into a great industrial power. The Robber barons were, in a way, national heroes, and unconsciously bound together in spirit with the man laboring at the spindle who dreamed of one day being a robber baron. The lesson of History teaches us all too well that no nation lacking a consensus, a reasonable agreement of the overwhelming majority of its people on basic philosophic and economic concepts, has maintained spiritual and economic strength. It would be impertinent to point out to this audience the greater importance of maintaining the national spiritual consensus stated by President John Adams in his proclamation of March 6 in these words:

... it is also most reasonable in itself that men who are capable of social arts and relations, who owe their improvements to the social state, and who derive their enjoyments from it, should, as a society,

## from Profits

*make acknowledgements of dependence and obligation to him who hath endowed them with these capacities and elevated them in the scale of existence by these distinctions...*

In the area of economics we are equally in need of maintaining a unifying consensus if we are to retain our national vigor. Consideration of the role of profit in our industrial system promotes more divisiveness among academicians, politicians, businessmen and workers than any other aspect of our economy. To the worker profit is the justification for higher wages, to the businessman profit is the measure of a job well done and deserving of greater financial reward, to the politician profit is something to be regulated and taxed away, to the academician profit is something to be debated and whose usefulness is to be seriously questioned.

Historically profit has been considered the wage of capital. In our present day corporate economy the role of profit has gone far beyond its historical function. It seems evident that today corporate profit is a primary fiscal support for our federal government, a source of funds for research and development of new and better products, a provider of capital for new plant and equipment and hence for jobs, and lastly and perhaps leastly a source of dividends to the shareholder.

In a recent study published by the Bell Telephone System, 50 large industrial companies were grouped accordingly to profitability. In the thirty-year period studied, the 25 more profitable companies increased their capital three times faster than the less profitable group. In the last decade studied, the more profitable companies increased their employment twenty per cent while the employment of the second group actually declined eight per cent. Unfortunately the rate of return on capital earned by the fertilizer industry fits it squarely into the category of the less profitable group of the Bell Study. Five of the larger

companies in integrated plant nutrient business showed, over the last five years, an average after-tax return of 7% on net assets as compared with 14% for the chemical industry as a whole. Four typical smaller companies primarily concentrated in the mixed fertilizer business, in the last year for which figures were available, showed a profit of approximately \$600,000 on a combined net worth of some \$17,000,000—a return of less than 4% and I might add that this was a good year. Clearly the fertilizer industry belongs to the second group of the Bell Study and, in the words of the study:

*... growth research, new and better plant all come from profit. Poor profits make a firm impotent in these fields. ... Without growth, research and new plant the poor firms fail to serve the consumer well. They cannot offer new or better products. They cannot build more efficient plants to cut the cost of the product, and they cannot offer more jobs or better pay. In almost every case studied lay-offs and poor profits have gone hand in hand.*

The preponderance of new developments in the mixed fertilizer industry emanating from government supported research rather than from industry seems to offer sound confirmatory evidence as to the submarginal returns offered in the mixed fertilizer industry and sound confirmatory evidence as to the accuracy of the allegations of the Bell Study. In the short space of time since receiving my invitation to appear here there has been a wave of mergers in the mixed fertilizer industry, further confirmatory evidence of the difficulties besetting the profit based mixed fertilizer company in attempting to continue to serve the farm economy satisfactorily while retaining sufficient earnings to develop and grow.

A fair question at this juncture might well be, and what does the low profit status of the mixed fertilizer industry have to do with those of us who are in the field of agronomy? It seems to me that for the good of agriculture the time has come for you to help to create a climate of opinion more favorable to the continued investment of funds in the mixed fertilizer industry. As leaders in the field of agronomy you have a responsibility to examine the question of profits and strive to reach a philosophical consensus, an agreement in principle that would dispel any hostility in

your own minds toward profits. Certainly it would seem that you would agree that inability by the industry to earn profits sufficient to pay taxes would be an unfortunate development. Reflection would seem to further lead to the conclusion that a continued dearth of profits available for research and development, for process improvement and growth of productive capacity in pace with demand would indeed be unfortunate. Certainly we can agree that some equitable profit should also accrue to the long suffering shareholder. The late Pope Pius XII put a strong case for equitable profit distribution in these words:

*Wealth which is constantly being increased by social and economic progress must be so distributed amongst various individuals and classes that the common good of all is procured. So, one class cannot forbid another a share in the profits. Neither labor nor capital have a right to the lion's share. Toil alone cannot give an exclusive title to profit. There must be a just distribution according to the common good as each class receives its due share.*

If you would agree that a profit sufficient to provide a fair wage for capital and labor, a surplus for research and for development and for improvement is merited by the fertilizer industry, I urge you to exert your powerful influence to lessen the all pervasive emphasis on the destructive price competition now weakening the mixed fertilizer industry. I urge you to exert your powerful influence to secure general acceptance of economic principles recognizing the role of reasonable profit in enabling the mixed fertilizer industry to enhance its ability to serve agriculture with improved plant, processes and products.

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**It is only from  
an adequate profit  
that any industry  
—or company—  
can finance  
necessary research  
and development.**

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## **Soil Men Told Need for Research**

Man's skill in feeding plants will go a long way toward helping plants feed man in the crowded years ahead.

Though population is exploding and farm land shrinking, scientific fertilizing of the soil can meet the demand for more food, Dr. Daniel G. Aldrich, Jr., head of the University of California's Division of Agricultural Sciences, told the plant nutrient division of the Soil Science Society of America.

Among all the technological advances available to agriculture, he said, fertilizers may make the greatest contribution to efficiency of land use and quality of farm products.

"We have by no means reached the production potential of the arable soil we now have, if suitable plant nutrients can be used with judgment," Aldrich told the national group of plant nutritionists.

Dr. Aldrich, University Dean of Agriculture and professor of soils, said it has become clear that the sales representatives of the fertilizer industry and the Agricultural Extension Service must team up to give the full service they would both like to give to farmers.

California studies, he said, show that a large proportion of farm operators look to the fertilizer salesman for advice and follow his recommendations. But the study also showed that both farmer and the salesman look to the Agricultural Extension Service and Experiment Station as the sources of information.

The University of California, Aldrich said, is looking for better ways to inform the fertilizer salesmen and keep the industry-Extension team working to the best interests of agriculture.

"As farmers look to the future," he said, "they must strive continually to find means of producing food and fiber more efficiently . . .

"Research has been called the key to tomorrow. But research contributions are only as good as the application of them for the benefit of mankind.

"It is to this task that all agencies advising the farmer must dedicate themselves. They must pool their resources and coordinate their efforts to see that the grower has and knows how to use the information that will enable him to realize the full potential of the soil through the wise use of plant nutrients."

## ALABAMA

**Alabama Farmers Cooperative** at Decatur started production with their new granulation unit early last month. The equipment was installed by Fertilizer Equipment Sales Corp.

## ARKANSAS

**Planters Fertilizer & Soybean Company**, Pine Bluff, is back in production after having their plant almost completely destroyed by a major fire last April. The fire destroyed the building housing their bulk storage and most of the granulation facilities.

A completely new storage building, over 300 feet long and about 150 feet wide has been completed with additional customer loading docks. New granulation facilities are in operation, and inventories of mixed fertilizer are being built up.

Additional loading facilities and a second bagging unit are nearing completion. The firm has also added new granulation equipment, including new Tyler-Hummer vibrating screens, an Omega feeder, and separate cooler and dryer, a TVA ammoniator and cluster weigh-hopper. Two new Kraft automatic bagging units, each with mixing units, have been installed to insure speedy blending and screening of any grade of fertilizer.

With the new building, loading facilities have been greatly improved and will accommodate from 3 to 5 trucks at one time. The bagged storage will be on pallets to expedite loading and will be handled by a 600-ton fork-lift truck. Bags taken from the pallets are placed on one of four loading conveyor belts. Facilities also include bulk loading. They now offer mixed goods in 100, 80 and 50-pound heavy duty multiwall bags.

The new steel and Transite building offers a bulk storage area of 230 x 120 feet, and includes a new hopper car unloader.

Planters Fertilizer have just added their third transport truck for hauling anhydrous ammonia to various field service stations.

Planters is operated by four Dunklin brothers: George, Lewis, Jim and Bill.

## CALIFORNIA

**Swift's** El Centro warehouse was one of a string of fire victims in that city, listed as definitely the work of arsonists by the local fire chief. There has been labor unrest in lo-



cal agriculture, and this is suspected as the reason various concerns have suffered. The Swift fire was in an area containing ammonium phosphate and ammonium nitrate. Police warned an area of some 5,000 population and ordered evacuation. There were no injuries reported.

## FLORIDA

**International Minerals & Chemical** has announced a \$5,000,000 expansion program at its Noralyn and Achan plants. Noralyn is now building a phosphate rock calcining plant with a kiln that is to be 230 feet long and 11 feet in diameter, which should provide 400,000 annual tons.

Other portions of the program include a huge new Bucyrus-Erie dragline, and plant expansions in both facilities, which are now in the engineering stage. These include doubling of Noralyn wet rock storage, tripling of grinding capacity and unloading facilities.

The new dragline goes to Achan. It has 2200 horsepower and a walking speed nearly double that of present equipment.

J. L. Cox has been appointed manager of the expansion program, relieving Harry M. Feigin, in charge since the expansion program was begun, who can now return to his regular responsibilities as administrative manager. Colin Campbell steps into the post of mineral operations manager, vacated by Mr. Cox.

**W. R. Grace's Davison Chemical division** has completed extensive modernization and expansion of phosphate rock mining facilities at its Bonny Lake mine, at Ridgewood. This modernization followed closing of the Davison Pauway No. 4 mine near Lakeland, after nearly 40 years of operation in that vicinity.

Two draglines, flotation and other beneficiation equipment at Pauway No. 4 were transferred to Bonny Lake. At the same time, much

new equipment was installed to increase capacity at Bonny Lake by a significant amount.

Two Dorr-Oliver hydrosillators have been installed, the first time such equipment has been used in the Florida phosphate field. New DSM screens and conventional vibrating screens provide further size breakdown.

A unique feature of the Pauway No. 4 operation, now concluded, was the rehabilitation of an area of mined-out land on the outskirts of Lakeland. Dredging, filling, and other landscaping was done to transform the area into a residential subdivision, complete with artificial lakes.

**Virginia-Carolina**, as we went to press, was preparing to put into production its new \$1,000,000 diammonium phosphate plant at Nichols—the first of its type built in Florida. The plant was named for executive vice president Charles T. Harding.

Design engineering and construction have been in the hands of Wellman-Lord Engineering. The plant is slated to produce 100,000 annual tons of DAP, and includes the latest air pollution preventive equipment. Wyllys Taylor is V-C's project manager.

**Fletcher-Johnson Fertilizer Co.** has been established at Greensboro, in the heart of the shade tobacco growing area. Officers Edwin Fletcher and C. D. Johnson expect to be in operation this month, mixing goods for tobacco.

**Ideal Fertilizer Co.**, Bartow, which specializes in custom formulae, are planning a considerable expansion program for the near future, according to president R. W. Garrett. The company has been under the present management since 1953. Other officers are: W. E. Blount Jr. and Monte J. Tillis, Jr., vice-presidents; Clyde Gibson, secretary-treasurer.

## IDAHO

**Bunker Hill** is moving fast these days to make up for the 7½ months delay caused by a strike. Their \$2,000,000 Dorr-Oliver designed phosphoric acid plant at Kellogg is headed for its rated 130 daily ton capacity. The \$225,000 anhydrous plant for Collier Carbon & Chemical, also at Kellogg, is completed and will use Bunker Hill's highly concentrated green phosphoric acid, as our readers know.

Now we learn that plans are being drawn for a \$5,000,000 investment in a sulphuric acid plant and sintering unit at the Kellogg lead smelter. Capacity is said to be planned for some 75,000 annual tons which will build up the Bunker Hill capacity to about 200,000 annual tons. Included in the present plan is the installation of a single unit to replace the 10 sintering machines now in operation.

Final decision on these plans will be made when the design and engineering studies have been reported to management, which is expected to take place this year.

\* \* \*

**Valley Nitrogen Producers** of Helm, Calif., has set up a processing facility for phosphate ore mined in the Soda Springs district.

Valley has constructed a 60-inch Raymond roller mill for grinding an initial 45,000 tons of ore mined by Terteling and Sons, at holdings on the Blackfoot River, 25 miles north of Soda Springs.

Already shipped to Helm, near Fresno, are about 6,000 tons of the ore, running at 30 to 40 per cent  $P_2O_5$ , after being pulverized to 100 mesh and dried. At Helm, Valley produces anhydrous ammonia, ammonium phosphate, and a line of blended fertilizers containing phosphate, potash and nitrogen. Valley is a farm cooperative.

The mill and drying equipment were purchased from a phosphate producer in the Tennessee phosphate belt, moved to Soda Springs by rail and re-erected.

Monte De France, supervisor for Valley, said it will be Valley policy to contract on an annual basis for an ore supply from independent producers in the Soda Springs district. By grinding and drying at Soda Springs, Valley can reduce the ore 10 percent in weight and also attain a more compact material for shipment by rail.

The mill now is operating on a two-shift basis and processing 150 tons of ore daily. Daily tonnage will

be increased to 180 through plant modifications, Mr. De France said.

## ILLINOIS

**Aylco Chemical Co.** has announced another new liquid fertilizer retail store with Gayle Bane as manager at Saybrook. Aylco headquarters at Sullivan. They do contract application, free soil testing, and supply Aylco 41% 3N low pressure N for side-dressing.

## INDIANA

**Elanco Products Co.**, Indianapolis, have launched an unusual line of lawn and garden chemicals. These are listed as a crab grass killer and complete lawn food, a garden grass control, and a plant food with garden grass control. These are all under the Greenfield trade name, and are being test-marketed in the Ohio-Indiana area in 2 and 5-pound containers.

A feature of this new line is the use of diphenatril, which the concern features as Dipan.

Elanco is a division of Eli Lilly.

## IOWA

**Gro-Mo-Co** is building at Center-ville a blending plant which is due for completion this month. On a 100 x 100 foot site, it is 52 x 90 feet, with a 1200 ton storage capacity. Gro-Mo-Co has a plant at Blythe-dale, Mo. and is building another at Osceola.

## LOUISIANA

**Bunkie Phosphate Co.**, Bunkie, has filed with the Secretary of State, Louisiana, increasing its authorized capital stock to \$100,000.

## MASSACHUSETTS

**Springfield Organic Fertilizer Co.** has been awarded the contract to supply Hanscom Air Force Base with 450 tons of fertilizer this spring and summer. The company has rebuilt the burned-out composting plant at Bondi's Island, where these goods will be made, and have installed there a new \$150,000 digester. S.O.F. holds a garbage disposal contract at no cost to the City and is said to be considering a proposal to collect and dispose of all trash and garbage.

## MISSISSIPPI

**Dixie Fertilizer Company** is in operation with its new plant at Meri-

dian, which is to produce a million small packages per month of bat guano based fertilizers, labeled Velve-Gro and Hill-Actinite. Dixie principally manufactures superphosphate and complete mixed fertilizers on a 30% sludge base, with 120,000 annual tons capacity. Billed as "the largest and most modern fertilizer plant of its type in the US," the locally owned plant staged a big opening, with Miss America on hand, late in January.

\* \* \*

**Southern Materials of Mississippi, Inc.**, is spending \$200,000 to \$300,000 in construction of a plant to manufacture agricultural lime. Located between Clinton and Raymond in Hinds County, the firm controls one and a half million tons of limestone, which will be produced into agricultural lime for distribution throughout the south.

## MISSOURI

**Earl Hargis**, operator of a fertilizer and limestone business in Lebanon, has built a new \$20,000 bulk blending plant there with a 100 daily ton maximum of custom grades, and has a six-truck fleet for application service.

## MONTANA

**Agrilease Inc.**, Billings, has filed for incorporation listing 50,000 shares at \$1 par value. Incorporators include Hal W. and Margaret O. Bick; and John M. Dietrich, Jr.

## OHIO

**Phillipsburg Mill**, Phillipsburg, has been granted a permit to set up a 30-ton all-steel bulk fertilizer facility.

## TEXAS

**First Mississippi Corp.**, Jackson, Miss., are making a market study for a nitrogen complex to cost between \$10,000,000 and \$15,000,000 in the Houston-Gulf Coast area. According to vice-president and general manager J. F. Babbitt, they are looking for 200 to 300 acres with access to raw materials.

## UTAH

**Texas Gulf Sulphur**, whose contract award on their new \$25,000,000 plant at Moab we reported here last month, will have an elaborate

## —Around the Map...

railroad set-up. The Denver and Rio Grande Western will spend an estimated \$5,000,000 to build 40 miles of track from its main line, expecting some 15,000 annual carloads of new business. Siding at the plant will be enough to hold 140 cars at one time for loading.

### WASHINGTON

**Rosalia Soil Service Inc.** has been incorporated at Rosalia for \$50,000 to deal in chemicals, fertilizers and other materials. George W. Shoemaker, attorney, 1327 Old National Bank Building, Spokane, filed the papers.

### WISCONSIN

**Mid-West Soil Builders**, Stitzer, have announced expansion which includes a large warehouse. They plan to offer custom application of both liquid and dry fertilizer, according to Dorvan Rolston, new manager.

### WYOMING

**Kern County Land Co.** is exploring the Raymond Canyon area of southwestern Wyoming for phosphate.

Initially, the Raymond phosphate deposit, located near the Idaho-Wyoming border, was investigated during World War II for vanadium by the Homestake Mining Co., which later gave up its interests.

W. T. Griswold, San Francisco, manager of exploration for Kern County, said the firm is "primarily interested in phosphate" values at Raymond Canyon. He said the Company was "interested" in phosphate "generally," whether in Raymond Canyon, elsewhere in the Intermountain country or in Tennessee. The phosphate at Raymond is estimated at 22 to 32 per cent  $P_2O_5$ , he said.

The exploration manager also confirmed that the concern had drilled several core holes in the Green River, Wyoming, trona district for purposes of evaluating a deposit on leases. These core holes will help Kern County determine location and cost of any shaft which would be required to develop the deposit.

Mr. Griswold refused to identify any single firm with which Kern County was talking on phosphate or trona, adding that a number of companies had expressed interest.

Neither the trona nor the phosphate developments have matured

sufficiently to discuss capital construction in their connection, he explained.

\* \* \*

**Milwaukee's Sewerage Commission** is definitely not planning to get out of the "Milorganite" business, sales manager C. G. Wilson has asked us to emphasize. In January we reported in this department that Milwaukee's new Oak Creek disposal plant will dump waste solids into a lagoon, and no Milorganite will be produced there. Mr. Wilson asked us to make it clear that the city will continue to turn out the sludge product at its Jones Island facility, and even plans to step up the 70,000 annual tons output to "85,000 tons per year over the next decade." The Commission has spent \$5,000,000 in the past four years for new dryers, filters, etc., has bought new bagging machines, and will build a new \$500,000 shipping plant this year.

### CANADA

**Consolidated Mining and Smelting Co.**, Montreal, has gone into production with its \$5,000,000 plant at Calgary, Alberta, which is rated at 100 daily tons of urea. Engineered by Vulcan-Cincinnati, the plant uses natural gas as its raw material, and has adjacent a 10,000 ton urea storage building, along with separate bagging and shipping facilities.

The normal product will be prilled. Both ordinary and foliar grades will be made, for sale in Western Canada and the US. Urea will also be sold in solution.

At Cominco's Kimberley plant they are planning to convert, into sulphuric acid, the impure sulphur dioxide from the new \$7,500,000 pig iron plant there.

\* \* \*

**Border Chemical Co.**, Transcona, Manitoba, expect production this month from their \$250,000 copper sulphate plant—which is expected to reach 6,000,000 annual pounds. This plant will help meet the demand from domestic sources; 40% of Canadian copper sulphate has heretofore been imported.

### EIRE

**Fisons** are reported considering the establishment of an ammonia plant and have under construction sites at Dublin and Cork with alternative locations in Britain.

\* \* \*

**Shamrock-Avoca Ltd.** has been

formed to plan an \$11,000,000 sulphuric acid plant close to the Irish Copper Mines at Avoca. Irish and Belgian interests have joined forces in this project: Consolidate Mogul Mines; Shamrock Superphosphates; St. Patrick's Copper Mines—a subsidiary of Irish Copper.

### INDIA

**Sindri** is still in trouble, operating at only 60% of capacity. Blame is laid locally to poor maintenance and frequent managerial changes. An example is given: Double salt was stocked in bulk and some 15,000 tons became a solid hill which is now being broken up in slow stages with picks.

**Rahuri Cooperative Sugar Factory** shareholders have decided to set up a fertilizer factory in the cooperative sector to produce 40,000 annual tons of superphosphate, and 16,500 annual tons of sulphuric acid. Cost is estimated at Rs. 64 lakhs, 12 of which are to be collected by the end of this year.

\* \* \*

**West Bengal's** fertilizer factory at Durgapur will be built and operated in collaboration with US firms, which will hold 51% until the end of 10 years when the Government will buy control. The plant is to cost Rs. 25 crore.

The plant will produce nitrogenous fertilizer and will have capacity of 60,000 annual tons of "nitrogen content." Completion is expected within 32 months.

A nearby operation will be expanded to supply coke.

### ISRAEL

**Dead Sea Potash**, Sodom will have its production increased fourfold to more than 500,000 annual tons, if the delegation which came to New York is successful in borrowing \$50,000,000 from the World Bank and two private banks.

### PHILLIPINES

**Marinduque Iron Mines Agents, Inc.** propose a \$23,000,000 plant to produce copper from ore to shapes, which will also turn out 100,000 annual tons of ammonium sulphate fertilizer. The project is being discussed jointly by representatives of Foster Wheeler, who will build it, the E. W. Bliss Company, who make copper rolling equipment and Jesus Cabarrus, president of Marinduque, who will locate the plant on Iligan Bay on Mindanao Island.



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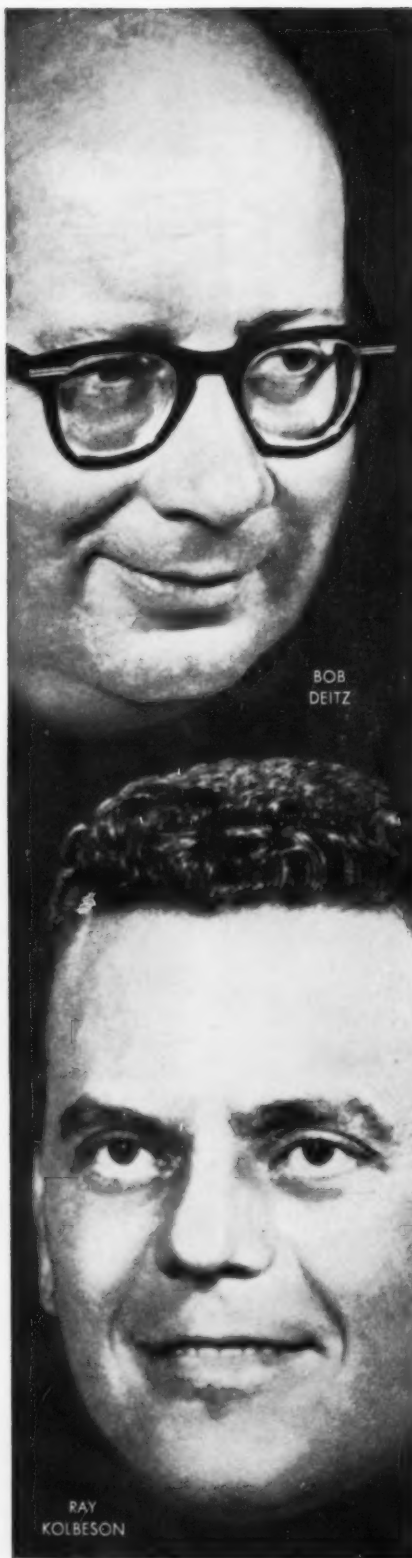
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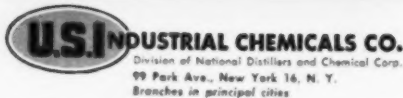
Many U.S.I. customers in the fertilizer industry know Bob Deitz and Ray Kolbeson. As chief and assistant chief chemists at our Tuscola, Ill., Plant Laboratory, their imprint is on each tank truck and car of U.S.I. fertilizer chemicals — ammonia, nitrogen solutions, sulfuric acid and phosphoric acid — shipped from Tuscola. They head a team responsible for the quality of all fertilizer chemicals made at Tuscola.

Yet these chemists do much more than simply provide the customer with an analysis of each shipment. They inspect plant production continually to help maintain the consistent quality customers require. And the analytical knowledge possessed by Bob, Ray and their colleagues is at the disposal of U.S.I. customers for all sorts of problems.

For example, they will perform special analyses for trace materials or uncommon constituents . . . will provide both standard and special test procedures. They have helped newcomers to the fertilizer business set up labs by providing advice on equipment, procedures, personnel. And they have carried out check analyses with customer labs.

Both men bring wide experience in the field to their jobs. Bob has been an industrial chemist for 20 years—three of them as a referee analyst in inorganic chemistry. He is now a member of the National Plant Food Institute's Task Force for Liquid Fertilizers. Ray numbers 12 years as a research and industrial chemist.

These men work for you as well as for us. A call to U.S.I. Heavy Chemical Sales in New York — OXford 7-0700 — can put them at your service.



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# How Union-Camp's 5-Star Plan saved multiwall bag user over \$130,000 a year

**M**aking things the same can sometimes make a whale of a difference. Particularly in a multiwall bagging operation. The Smith-Douglass Company, Inc., of Norfolk, Virginia proved it recently when they put Union-Camp's 5-Star Plan into action. The difference—in annual packaging savings—came to over \$130,000 a year!

## Standardize = Economize

Initial 5-Star Plan surveys at Smith-Douglass' six plants revealed that *standardization* held the key to major cost reductions. Three plants used sewn open-mouth multiwall bags. One used sewn valve bags. The remaining two plants used both types of bags.

Union-Camp's multiwall specialists showed that \$30,000 a year could be saved by converting all six plants to sewn open-mouth bags and using open-mouth bag filling machines.



**5-Star Plan in action.** Plant surveys made by Union-Camp multiwall specialists paved the way for the major packaging savings described here.

That was only the beginning. By carrying the change-over one step further, and standardizing on *size* and *construction* of multiwall bags, the company would save another \$22,000 a year.

## 1 Design Replaces 160

Next, Union-Camp's survey team analyzed the company's existing bag *designs*. They found there were about 160 designs being used. Here, again, standardization was recommended.

By creating one basic design, eliminating an expensive yellow outer sheet, and using the same printing copy for all bags, the company netted additional economies of \$84,000 a year.

\$30,000 plus \$20,000 plus \$84,000. Total annual packaging savings—\$134,000.



**\$30,000 a year savings** resulted from converting to sewn open-mouth multiwalls in company's six plants.

## How Much Could You Save?

Hundreds of companies—large and small—reduce their multiwall packaging costs by taking advantage of Union-Camp's 5-Star Plan. This comprehensive service is free. It covers

bag design, bag construction, specifications control, packaging machinery and a survey of your materials handling operation. An improvement in any one of these areas conceivably could result in substantial economies for you.

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**This basic bag design**, now used for all Smith-Douglass brands, reduced company's multiwall costs by \$84,000.

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# INDUSTRY PEOPLE

## U. S. Borax



Riemer



Gerstley

Hugo Riemer, former executive vice president, has been elected president of United States Borax & Chemical Corporation and James M. Gerstley, former president, has been named vice chairman of the board, the company has announced.

Chairman F. A. Lesser stated that the management change resulted from a request by Mr. Gerstley to play a less demanding, though continuing role, with the company.

Mr. Riemer joined the company as executive vice president in October, 1958. From 1935-58 he was associated with Allied Chemical Corp. His last post at Allied was as president of the Nitrogen Division, from 1953 until his departure in 1958.

Mr. Gerstley originally joined Pacific Coast Borax Company, predecessor organization to the present corporation, in 1933. In 1956 Pacific Coast Borax merged with U. S. Potash Company and Mr. Gerstley was elected president of the merged company.

Dr. Wang Mo Wong has joined the pilot plant research staff of U. S. Borax Research Corporation at the Boron, Calif., installation of United States Borax & Chemical Corporation, it is announced by D. L. Sawyer, director of pilot plant research. Dr. Wong has been placed in charge of the organic pilot plant.

## Farmers Union

Jerome Tvedt has been named director of the feed, fertilizer and agricultural chemical division of Farmers Union Central Exchange, St. Paul, Minn., succeeding the late C. K. "Jim" Harmison.

## Royster

F. S. Royster Guano Co., has promoted five of its key executives. Announcement was made by F. S. Royster Jr., board chairman, and Charles F. Burroughs Jr., president.

Frank S. Moore, vice president in charge of manufacturing, has been named executive vice president, a newly created position; Dr. T. N. (Tex) Gearreald, company treasurer, is now vice president and treasurer; C. G. (Cliff) Baughman, general sales manager, was made vice president; J. Frank George, asst. vice president for manufacturing, was promoted to vice president; and A. O. Carroway, company comptroller, was named vice president.

## Federal Chemical

Federal Chemical Company announces the appointment of sales and production managers for its newly acquired Whitewater, Wisconsin plant.



Winter



Edwards

Roland Winter, who has been in charge of Northern Illinois sales for Federal and manager of their Rockford, Illinois warehouse, has been named division sales manager.

James Edwards, for the past seven years general foreman of Federal's Louisville, Kentucky plant, has been appointed production manager at Whitewater.

## Gilman Paper

Dean Wellington, general sales manager of Gilman Paper Company, announces that Tom L. Jones, formerly special representative for Kraft Bag Corporation, now Gilman's multiwall bag subsidiary (see *Changes*, this issue) has been appointed sales manager in charge of multiwall bag sales, with headquarters at 630 Fifth Avenue, New York. Tom L. Jones formerly was vice-president and director of multiwall sales for Arkell & Smiths.

## Armour

Several appointments in the nitrogen-phosphate division of Armour Agricultural Chemical Company have been announced by R. L. James, company vice-president and general manager of the nitrogen-phosphate division.

Frank Dunbar has been named manufacturing manager of the nitrogen-phosphate division. He joined the company in 1934.

H. E. Maune has been appointed project manager of the company's new ammonia and complex-fertilizer plant to be constructed near Sheffield, Ala. He will become manager when construction has been completed.

Grant F. Davis has been named manager of Crystal City ammonia and derivatives plant, to succeed Mr. Maune.

Harold N. Hedrick has assumed the duties of works manager of all of the company's phosphate rock operations in Florida.

George Gagel has been named project manager of Armour's new triple superphosphate plant to be constructed in Polk County, Fla., and will become manager of that plant when construction has been completed.

W. D. Whatley has been named manager of the triple superphosphate plant in Bartow, to succeed Mr. Hedrick.

H. Vise Miller, Armour vice-president and general manager of the firm's fertilizer division has announced that Harry F. Scruggs has been appointed credit manager of the company's Jacksonville, Fla., division, to replace William B. Almon, who is retiring after 35 years of service.

Mr. Miller also announced the appointment of Diego R. Caparros as credit manager in San Juan, to replace Mr. Scruggs.

## Richardson Scale

John Hageman, sales representative for Richardson Scale Company in the Buffalo, New York, area, has retired from active service with the company. He is succeeded by Kenneth Kardux, who will cover the Toronto, Ontario, district in addition to the Western New York terri-

## —Industry People...

tory. Mr. Kardux has been New York district manager for the company since January 1, 1960. Mr. Hageman will continue to serve as sales consultant for Richardson in the Buffalo-Toronto area.

### Bradley & Baker



Luman

Bradley & Baker announces the appointment of Virgil C. Luman as sales representative. He will represent them in the states of Iowa, Nebraska, Colorado, Kansas and Missouri. Mr. Luman will reside in Columbia, Missouri.

### Union Special

Union Special Machine Company recently announced the appointment of Marion O. Moulton as sales manager of domestic sales. In this position, he has succeeded Travis S. Whitsel, vice president, now retired



Moulton



Brown

after a forty-two year career with the company. Mr. Whitsel is being retained by Union Special as a consultant and also has interests in other consulting work within the industry.

Other promotions: Larry M. Brown was named assistant sales manager; John R. Haderly, manager of technical sales; and Jack R. LeTourneur, assistant district manager at New York. Guenter Glueck has been appointed representative to take over the sales territory previously served by Mr. LeTourneur.

Mr. Moulton joined the company in 1933, and had served as district manager at Atlanta until he was named assistant domestic sales manager two years ago.

Mr. Brown has been with Union Special since 1939, and has been manager of technical sales for two years. Mr. Haderly has been with the firm since 1941, and was most recently assistant district manager at New York.

Mr. LeTourneur joined them in

1946 and has been in sales in the Troy, N. Y. area since 1950. Mr. Glueck has been with Union Special since 1954.

Raymond E. Hinton has been appointed to succeed the late Barney L. Rogers as representative in the Kentucky-Indiana territory. He has represented Union Special in Ohio and parts of Indiana and West Virginia since 1947, having joined the company in 1939.

### Nitrogen Products Division

The following executive personnel changes have been announced by R. Q. Parks, general manager of the Nitrogen Products division of W. R. Grace & Co., Memphis, Tennessee.

B. L. How, formerly ammonia products manager and administrative assistant in Memphis, has been temporarily assigned to Federation Chemicals, Ltd. in Trinidad as assistant to the general manager. W. R. Grace & Co. holds an interest in Federation Chemicals, Ltd. and operates the plant under a management contract.

J. E. Little has been named ammonia products manager at Memphis to succeed Mr. How.

In another promotion, J. J. Ryan has been transferred from the Memphis office to the Chicago District Sales Office to succeed Russ Aves who has resigned.

Max M. McCaslin has joined Nitrogen Products Division, as a special sales representative in the Midwest area, with St. Louis headquarters. The position was created to give more intensive coverage of the territory.



McCaslin

For the last six years Mr. McCaslin was ammonia supervisor in the Midwest district of the plant food division of Olin Mathieson Company.

### W. R. Grace & Co.

W. R. Grace & Co. has announced that George A. McMoran, Jr., has joined its public relations department.

Prior to joining Grace, Mr. McMoran was with the public relations department of Allied Chemical Corporation in New York. His responsibilities there included direction of publicity programs for the company's plastics and nitrogen divisions.

### Dorr-Oliver

Dorr-Oliver, Stamford, Connecticut, has announced the election of



Fox



Brown



Reed

William J. Fox, vice-president—domestic operations, to the board of directors, his resignation from the office of secretary of the corporation, the resignation of G. H. Dorr II as treasurer, the election of Rowland C. W. Brown to replace Mr. Fox as secretary, and the appointment of Glen G. Reed, a vice-president, to the newly created post of vice-president—international division.

In addition to his duties as secretary, Mr. Brown has temporarily assumed the duties of treasurer, and is expected to be confirmed by the board as secretary-treasurer of the corporation.

### Dorchester Fertilizer

George P. Lippincott, president and general manager of Dorchester Fertilizer Co., Cambridge, Maryland, has announced personnel changes in the Dorco family:

John S. Neild, Jr. has been moved up to assistant general manager; Elvin Thomas has become field sales manager; a newcomer to Dorco, Ernest Fuchs, will take over Elvin Thomas' former duties.

### Southern States Co-op

Succeeding Howard H. Gordon, W. T. Steele, Jr. has been named general manager of Southern States Cooperative, Richmond, Virginia.

### Poulsen

Bernard W. J. Pearce has been named general manager of Poulsen Company, Los Angeles, long-time manufacturers and designers of materials processing equipment. He was previously associated with Vibro-Equipment division of Southwestern Engineering Company, Los

Angeles, and was Western district manager in charge of sales for the Patterson Foundry and Machine Company.

Mr. Pearce assumes charge of engineering and sales for Poulsen Company, which makes units for the industrial processing and blending of wet or dry materials ranging from feeds and fertilizers to pharmaceuticals and food products.

### Virginia-Carolina

William T. Corl has been appointed assistant to general sales manager in the fertilizer division of Virginia-Carolina Chemical Corporation.



Corl

Based in Chicago, Mr. Corl will supervise V-C's Dubuque, Iowa, and East St. Louis, Illinois, sales offices. He will also establish and supervise a series of custom-mix fertilizer plants. V-C's first custom-mix operation is now being readied in Wellsville, Missouri.

Mr. Corl was formerly general manager of the Plant Food Division of Darling and Company, Chicago. He was associated with Darling for ten years, serving in sales, procurement, and production before becoming general manager.

### Bennett Chemical

William F. Mierke has joined Bennett Chemical Company of Denver, Colorado, it has been announced by Richard E. Bennett, president of the firm. Mr. Mierke will be in charge of sales of Bennett's products, secondary and trace element fertilizers in granular form. He previously was an agronomist-sales representative for Tennessee Corporation since 1954. Prior to that he was with International Minerals & Chemical Corporation, Plant Food Division, for 3 years. Mr. Mierke will be headquartered at Denver.



Mierke

### Farmers Elevator

John L. Sanders has been put in charge of the fertilizer division of Farmers Elevator Service Co., Ft.

Dodge, Iowa, and will service the members of the co-op in Iowa, Minnesota and South Dakota. Mr. Sanders was formerly with Spencer Chemical and, more recently with Mississippi River Chemical.

### Texas Gulf Sulphur

Texas Gulf has announced the retirement of E. F. VanderStucken, Jr., as vice-president and secretary but will continue as consultant. Hugh W. Strickland and Charles F. Fogarty, previously vice presidents, have been promoted to senior vice presidents. Bachmann G. Bedichek, assistant secretary, has been named senior counsel, and Harold B. Kline, administrative assistant, has been elected secretary of the company.

Mr. Strickland will have charge of sulphur production and, in the Gulf Coast region, of all other corporate activities as well. Dr. Fogarty will have responsibility for Texas Gulf's exploration activities and for the company's new \$25,000,000 potash project in Utah. As secretary, Mr. Kline succeeds Mr. VanderStucken.

### West Va. P & P

West Virginia Pulp and Paper Company has appointed William A. Breen sales representative for its multiwall bag division in Buffalo and western New York, in Pittsburgh and western Pennsylvania, it was announced by R. C. Masoner, district sales manager for the Division in Columbus, O.

### Smith-Douglass

The Smith-Douglass Company has announced the promotion of William H. Payne to assistant manager for sales of the Norfolk branch, supervising sales territories in the state of North Carolina. He has supervised Smith-Douglass' Raleigh territory for the last eight years.

Frank B. Fuller who has been appointed to succeed Mr. Payne in the Raleigh territory, has been employed by Smith-Douglass since 1956.

Norfolk branch manager Mills W. Darden stated that Mr. Payne would be responsible for sales supervision of the North Carolina portion of the company's territory managed from Norfolk. E. Kendall Eakes holds the same responsibility for the Virginia portion of the territory.

### U. S. Phosphoric

U. S. Phosphoric Products, division Tennessee Corporation, has announced expansion of its technical service with the appointment of Owen A. Niles, Jr. as technical service representative. He will serve the New England and Mid Atlantic states and will live in the Baltimore area. Mr. Niles has been with USPP since 1948 and has wide experience in all phases of their Tampa operations.



Niles

### Southern Nitrogen

Southern Nitrogen Company has announced the appointment of B. E. Cooper as sales representative in the company's South Carolina sales territory, where for the past five years he has been selling mixed fertilizers and direct application nitrogen solutions.

### Bemis

F. V. Deaderick, vice-president and director of personnel of the Bemis Bro. Bag Company and a member of the board of directors, retired from the company January 30, and was succeeded by E. F. Muehlhausen. He had been with them since 1918.

William J. Geimer, manager of the Bemis' packaging service in Minneapolis for the past 15 years, also retired January 30. He was succeeded by Robert J. McDonald. Mr. Geimer had been with Bemis for 44 years.

B. L. Willmore, vice president and director of procurement and materials, has been elected a member of the board of directors. A. F. G. Raikes, director of eastern operations, and E. C. Whitmore, director of product planning, have been elected vice presidents of Bemis, it was announced by Judson Bemis, president.

Mr. Willmore became associated with Bemis in 1946. Mr. Raikes joined the company in 1938. Mr. Whitmore joined Bemis three years ago.



Raikes

### Nordberg

In a recent announcement made by J. B. Bond, manager of the Mining, Crushing and Process Machinery division of Nordberg Mfg. Co. Milwaukee, Wisconsin, the following appointments have been made in the division. Harold N. Propp was appointed Western branch manager in the San Francisco office with T. D. Davis, former branch manager, continuing in that office as consulting branch manager; S. C. "Sandy" McComb was appointed manager in the Vancouver, British Columbia office and James W. Mc-

Manaway has been assigned as a sales engineer in Roanoke, Va. for the New York office territory.

### Marion Plant Life

George Alber, president of Marion Plant Life Fertilizer Co., Marion, Ohio, has named Dale Musgraves as manager of Dunkirk Plant Life Fertilizer Co., the new distributing facility the company is building at Dunkirk, Ohio.

### Ortho Division

Gordon G. Black, district manager for the Ortho Division of California Chemical Company in Whit-

tier, California, has announced the appointment of Paul M. Miller of Coachella, California, as an agricultural sales representative in the Thermal, California, area. Mr. Miller has been with the Ortho Division for seven years.

### Crown Zellerbach

Robert F. Gill has been named sales manager for the multiwall bag sales division, Crown Zellerbach Corporation. This is a newly created position within the division.



Gill

Mr. Gill's promotion is one of four new assignments to be announced by James W. Kincaid, division manager.

In his new position Mr. Gill will direct the division's sales force of 30 men in 17 offices across the nation. His offices will be at corporate headquarters in San Francisco. Mr. Gill is a nine-year veteran with Crown Zellerbach. His most recent position was national accounts manager for the multiwall bag sales division.

Other multiwall bag sales division promotions announced by Mr. Kincaid are:

Fred H. Bostock was named machinery sales manager. He had more than 30-years paper sales and management experience with Crown Zellerbach, and has served in San Francisco, Los Angeles, Seattle, Kansas City and Chicago offices.

A third promotion was appointment of Robert W. Minahan as the division's western regional sales manager. He will direct divisional salesmen in the 11 Western states, and has been in sales work with the multiwall division since 1951.

Appointment of Donn E. Nissen as San Francisco district sales manager was the fourth promotion. He will supervise divisional sales activity in the state of Nevada and Central and Northern California. Mr. Nissen joined Crown Zellerbach in 1950 as a salesman.

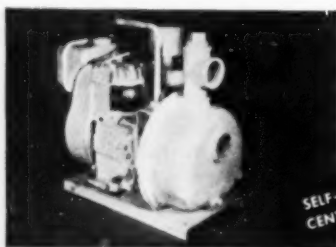
### Wheelabrator

Richard G. Genton has joined Wheelabrator Corporation, Dust and Fume Control Division, Mishawaka, Indiana, and has been assigned a three-state territory including California, Nevada, and Arizona where he will serve as regional dust and fume engineer, operating from Wheelabrator's Los Angeles and San Francisco offices.



Presents a Complete  
New Line of

## Dependable, Low Cost PUMPS



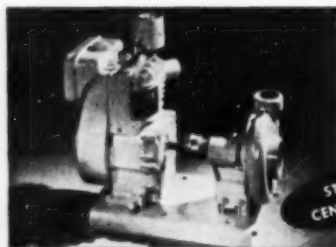
SELF-PRIMING  
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### For Pumping of Liquid Fertilizer

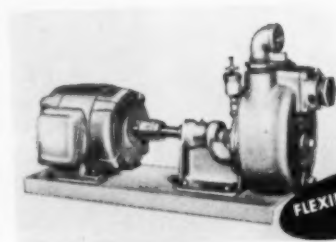
These dependable, ruggedly constructed CROWN pumps are especially designed and engineered to assure you a low cost pump that will deliver under the most demanding conditions. In a Crown pump you get fast action, long life and low maintenance costs.

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- Stainless Steel Models
- Reliable Cast Iron Construction
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CROWN FIRST . . . newly designed pump that enables you to inexpensively replace the volute and impeller . . . takes only minutes, but saves you many dollars in upkeep. Available in highly resistant NI-RESIST IRON.

For Complete Details  
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**CROWN MANUFACTURING CO.**  
WATERLOO, IOWA

# SYMBOLS OF PLANT LIFE



\* **B**ecause of the complete ignorance of the masses during the Dark Ages, alchemists, with their knowledge of chemistry, were presumed to be in league with the devil. In experimenting with potash, they were forced to resort to signs and symbols. If they didn't . . . the result could be death!

Today, potash means life . . . life to promote food and fiber growth for an ever-growing population.

Southwest Potash Corporation provides a dependable supply of HIGH-K muriate for the plant food industry.



*Distillation During 16th Century*

## **SOUTHWEST POTASH CORPORATION**

1270 Avenue of the Americas, New York 20, N.Y.



*\*A commonly used 15th Century Symbol for Potash*



READY

TO

GO!

## 13 St. Regis plants all set for speedy delivery

Whichever St. Regis® bag you want, whenever and wherever you want it, you'll get it... fast! St. Regis has 13 bag plants strategically located in the major fertilizer shipping areas to meet your national or local needs. Each can supply you with the complete line of bags and is fully equipped to give you swift, dependable service during peak-season rushes.

Fast delivery is only one part of St. Regis *Packaging-in-Depth*. This complete bag service assures you of the *right* bag, the *right* machinery to pack it, plus the services of a highly-skilled engineering staff. To meet your *future* needs, this program also includes continued research to develop improved packaging methods and economies.

PACKAGING-IN-DEPTH BY **St. Regis**  **BAG DIVISION**  
In Canada, contact St. Regis Consolidated Packaging Co., Ltd. **PAPER COMPANY**

# CHANGES

## **Kraft-St. Marys Merger**

The Kraft Bag Corporation, beginning the first of last month has been conducted as the Kraft Bag division of St. Marys Kraft Corporation, subsidiary of Gilman Paper Co., New York. This involves no change in manufacture, administration or sales.

## **Duval Moves Offices**

Duval Sulphur & Potash Co. has moved from the Mellie Esperson Building to 1936 First City National Bank Building, Houston 2, Texas.

## **PCA Moves Atlanta Office**

Potash Company of America has moved its southern sales headquarters to a new location in Atlanta, Ga., it has been announced by W. H. 'Buck' Appleton, southern sales manager.

The office is now located in Suite 218, 1776 Peachtree St., N.E., Atlanta 9, Ga. The new telephone is 875-7967.

Sales representatives working directly out of the office are Joe Scroggs, covering Georgia and Tennessee, and Dennis Robertson, covering Florida and Alabama. In addition, Lavoid Holloway, who covers Arkansas, Louisiana, Mississippi and Texas from Little Rock, Ark., reports to the Atlanta sales office.

## **Loda Liquid Fertilizer Sold**

Rex Haskett, owner-manager of Loda Liquid Fertilizer Co., has sold his business to Fred Bass of Tuscola, Myron Lecher of Champaign and LeRoy Shannon, who will manage the plant.

Earl Tobeck of Loda will serve as sales representative. The firm is adding a soil testing service to its operations.

## **Reid-Strutt Co., Inc. Named A-C Distributor**

Reid-Strutt Co., Inc., Portland, Oregon, has been appointed the first distributor for Allis-Chalmers chemical processing and food machinery.

Reid-Strutt Co. has sales offices in Portland, Seattle, Spokane, San Francisco, Fresno, and Nampa, Idaho; a warehouse in Portland, and a machine shop in Seattle.

## **John Deere Chemical Buys Ozark-Mahoning Plants**

John Deere Chemical Company has purchased the mixed fertilizer business of the Ozark-Mahoning Company, Tulsa, Okla., it was announced by W. W. Yeandle, president of John Deere Chemical, and C. O. Anderson, president of Ozark-Mahoning.

Under terms of the sale, John Deere Chemical will acquire the phosphoric acid-ammonium phosphate plants which are located near Tulsa on a 25-acre site adjacent to Ozark-Mahoning's sulphuric acid plant. Ozark-Mahoning will continue to own and operate the sulphuric acid plant and its extensive mining operations in various parts of the United States.

Purchase of the plant will broaden operations of the John Deere Chemical in the agricultural fertilizer field. Until now its only plant has been at Pryor, Oklahoma, where it manufactures synthetic nitrogen in the forms of ammonia and urea.

John Deere Chemical Company is a division of Deere & Company.

The plants sold to John Deere have been in operation for three years, and have approximately 65 employees whose employment will not be affected. Charles T. Longaker, who has been sales manager of the operation, and Norman A. Tandy, who has been plant manager, also will continue in their present positions. The plants' products will continue to be marketed under the "Ozark" brand name through established "Ozark" dealers.

The new combination will be basic in both the nitrogen produced at Pryor and the phosphoric acid produced in Tulsa.

## **Fertilizer & Chemical Shares Sold To American Company**

The Government of Israel has decided to sell the majority of government owned shares of Fertilizers & Chemicals, Ltd. to the Israel Investors Corporation, an American Company.

IIC will buy these shares for its own portfolio and will also make them available to the U.S. public, according to Samuel Rothberg, president. The purchase will amount to some \$10,000,000.

IIC, organized at government re-

quest in 1959, has already bought into other Israeli enterprises, including Dead Sea Works.

## **Virginia Ag Sections Moved**

Virginia Department of Agriculture sections have been moved to 203 North Governor Street, Richmond 19. Of most interest to our readers is the Chemistry and Foods division, with Fertilizer, Lime and Motor Fuels now in Room 302. Their mail address, however, is Room 304.

## **Commercial Solvents Buys Feed Vitamin Companies**

The acquisition of the assets of a complex of four companies which manufacture and market stabilized vitamins by patented processes for the animal feeds industry was announced February 24 by Commercial Solvents Corporation. The action was described by Maynard C. Wheeler, president, as a major expansion and extension of CSC's animal nutrition operations which will add approximately \$3,000,000 to sales volume for 1961.

The four companies are Stabilized Vitamins, Inc., Vitaron Chemical Manufacturing Company, Inc., and Astrol Products, Inc., of Garfield, New Jersey, and the Iowa Nutrition Company of Clinton, Iowa. The business will operate as the Stabilized Vitamins Division of Commercial Solvents.

## **Obituaries**

**James Ralph Beck**, 64, Oregon State staff member for 38 years and at his death assistant director of the extension service, of a heart attack.

**Dr. Arthur B. Beaumont**, 74, head of the University of Massachusetts, agronomy department, February 9 in hospital.

**James Thomas Kitchens**, 68, retired owner of Kitchen's Gin and Fertilizer Co., Waynesboro, Georgia, died January 29.

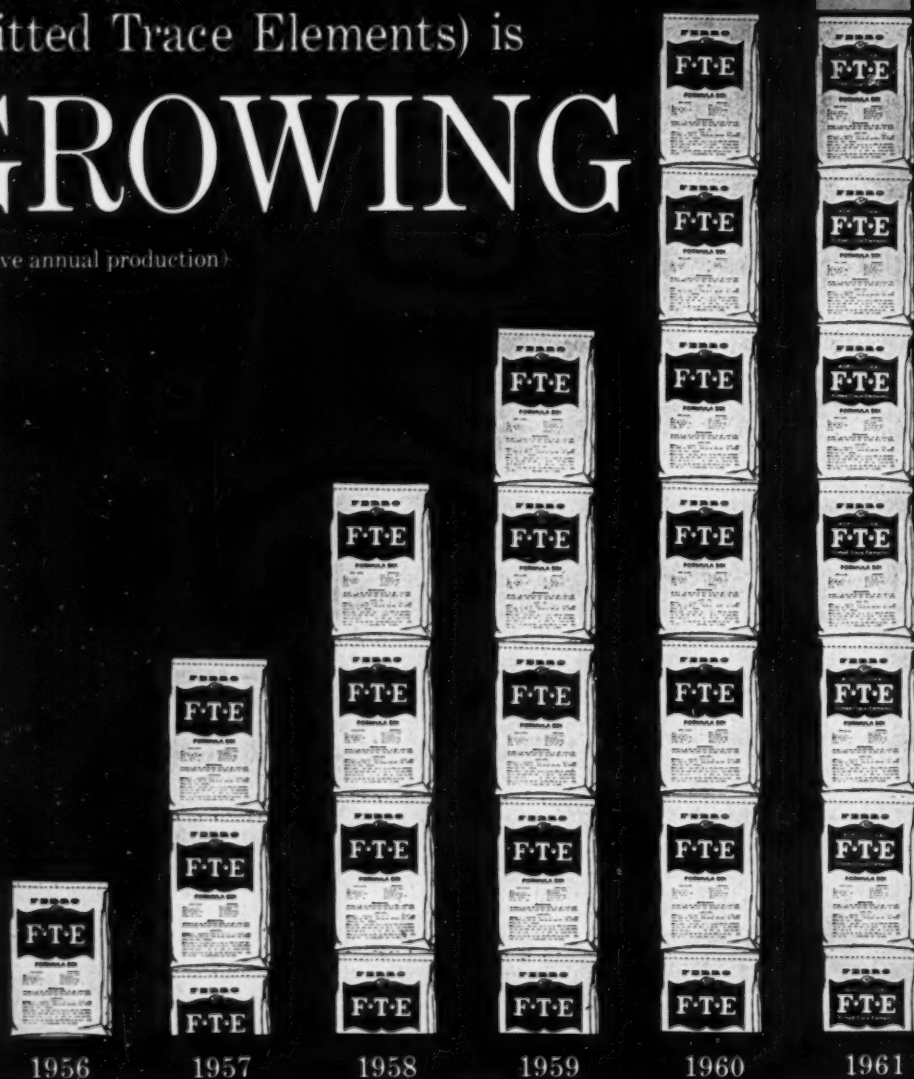
**Barney L. Rogers**, Union Special representative in Louisville, Kentucky, was stricken with a heart attack January 5, while on a business trip.

**Frank Rowsey**, 55, for a number of years before World War II editorial director of the Walter Brown Publishing Co., and Editor of COMMERCIAL FERTILIZER Magazine, died of a heart attack while on a business trip for the Coca-Cola Co., of which he had been an executive for the past 15 years, as manager of the publishing subsidiary which issues the Coca-Cola bottlers magazine.

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Where trace elements are needed, FTE is consistently winning new friends. As a source of *boron*... or *manganese*... or *iron, zinc, copper and molybdenum* it is unsurpassed. Combining all *six* in a single product, it produces excellent results—often with no more than 1% mixed into good fertilizers.

Unlike soluble salts that leach out in heavy rains, or become fixed in the soil under certain conditions, FTE releases the nutrients as needed. "Fritting" makes possible *controlled, predetermined solubility*.

This, in turn, makes fertilizers more productive, much more predictable.

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# Research Briefs...

**Corn maturity** is hastened by nitrogen, phosphate or potash fertilizers, Wisconsin's Dr. John T. Murdock reported at recent Lime and Fertilizer Dealer meetings, so long as they were balanced, in terms of major nutrients.

**2 N forms** help rice, says Arkansas Rice Branch AES. The actual quote: "Solid sources of N and N in solution are equally effective."

**Clover** makes a poor showing at lower pH and potash levels. At a pH of 6.5 and upper levels of potashclover can compete with high-rate nitrogen grass and close spaced grass. The research is being done by Clemson College, S. C. This is confirmed by U. of Georgia research which shows that potash is the nutrient most seriously limited the growth of crimson clover in combination with Coastal Bermuda.

## Spencer Offers 30-10-0 on Limited Basis

Spencer Chemical Company has announced the production of limited quantities of a new type of commercial fertilizer, 30-10-0. In making the announcement, Byron Kern, vice president of the company's agricultural and industrial chemicals divisions, said that the material has been produced by a new Spencer-developed process at the Jayhawk Works, near Pittsburg, Kansas, for use in introductory marketing this spring.

Mr. Kern said that this addition to the company's fertilizer product lines follows a study which indicates that 30-10-0 would be a practical material both for direct application and as a component of complete mixed fertilizers made by conventional methods or by bulk blending. He said that limited first-season sales of 30-10-0 will probably be mainly for mixing with other materials as it is ideally fitted for the formulation of certain ratios, such as 2-1-1 which have, heretofore, been difficult and often uneconomical for the conventional manufacture to produce. He added, however, that 30-10-0, which combines certain features of ammonium nitrate and ammonium phosphate, has potential value as a direct ap-

**Placement:** Iowa State reports that starter feeding of corn should not be deeper than an inch in side-bands because the roots developing from the kernel reach out horizontally at about this level.

**Plant comfort,** in terms of temperatures, is rated important by J. M. McGregor, University of Minnesota. He reports that chemical reactions in the soil which make nutrients available to the plant depend on favorable temperatures — "neither too hot nor too cold." Little soil nitrogen is available at 32°, more at 50°, much more at 75-80° . . . and availability begins to decrease somewhere above 80°.

**Alfalfa,** grown in acid soils, demands lime. On limed soil alfalfa yields went up 50% at the Kansas Columbus branch station.

plication material on many crops, particularly in the Midwest.

Spencer's activities represent the first production by an industrial firm of 30-10-0. The material will be in an easy-to-handle solid form similar to the ammonium nitrate and urea materials which the company now produces.

## IMC Advisory Panel Includes Leading Economist

A leading national economist will be a featured participant in discussions of the International Minerals & Chemical Corporation's Customer Advisory Panel in its annual meeting at Chicago March 8-9.

Martin Gainsbrugh, chief economist for the National Industrial Conference Board since 1939, will lead panel discussions about business and economic conditions. The NICB is a 45-year-old non-profit organization specializing in scientific research in the fields of business economics and business management.

This meeting of the Customer Advisory Panel is the fourth since it was organized by IMC. A rotating panel of 12 leading fertilizer industry manufacturer executives meets with IMC's top management and outside experts to discuss industry trends, objectives, problems and possible solutions.

## Foreman Safety Training Course At Low Cost

An effective, low-cost safety training course for industrial foremen has been developed by the National Safety Council.

Written by training-expert Glenn Griffin of the University of Michigan's Bureau of Industrial Relations, the course consists of a series of six text booklets entitled "Men and Motives in Safety Supervision," and a manual for discussion-group leaders.

Each text booklet is for a one-hour training session for foremen. The leader's manual tells how to set up meetings and apply the material to individual plant situations.

The course offers practical instruction on ways a foreman can better understand his men and work with them toward safer, more efficient work practices. "Griffin's style is clear and down-to-earth," according to the National Safety Council.

Further information about "Men and Motives in Safety Supervision" is available from the Council, 425 N. Michigan Ave., Chicago 11, Ill.

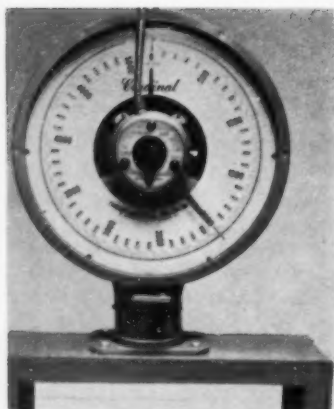
## U. S. Limestone Industry Grosses \$530,000,000

The production of limestone is an important American industry. With annual shipments valued at more than \$530 million, it ranks second only to cement among the non-metallic minerals other than fuels.

Limestone is the giant of the stone industry, which includes minerals such as granite, basalt, marble, sandstone, and slate. In 1958, for example, limestone producers turned out nearly 400 million short tons, a figure which accounted for about seven-tenths by weight and about two-thirds by value of shipments of all stone produced in this country.

The dominance of limestone (which commercially includes dolomite) results from its widespread availability, chemical characteristics, and easy workability, factors which contribute to an economic versatility of nearly 200 uses. A sedimentary rock, limestone is found in every state and produced commercially in all but two.

The three best "buys" for the farmer are credit, fertilizer and electricity.



### Cut-Off Control for Dial Type Scales

Cardinal Scale Manufacturing Company has announced introduction of a new Microset 606 weight cut-off control for all dial type scales.

Company representatives said the new Microset cut-off can be field installed on almost all dial-type scales requiring no modification of the scale itself. Installation can be done in a very short time at almost no expense.

Microset cut-off was designed for automatic cut-off of scale operated automatic machinery of any type that needs a simple, quick cut-off system. The new Microset can be operated by one man with a simple dial setting and the pressing of a button.

The Microset 606 can be equipped with single stage cut-off, or two-stage cut-off, and has maximum versatility. Optional circuit arrangements can be provided to fit almost any need.

For further information circle number 1 on CF's Information Service card, page 51.

### Bulletin on Semi-Automatic Bagging Scale Accessories

A new bulletin describing various accessories for the G-17 Semi-Automatic Bagging Scale has been announced by Richardson Scale Company. Bag holders, spouts, gate switches, and counters to register bags filled . . . all help the G-17 to meet widely diversified bagging needs in the chemical, feed and grain, and food processing industries.

Accessories are: (1) Camgrip bag holder; (2) Manually operated universal bag holder; (3) Air-operated universal bag holder; (4) Quick-change spouts; (5) Bag counter; (6) Portable scale frame, and (7) Gate switch.

The G-17 Scale may be supplied with belt feeder, with screw feeder, or with vibratory feeder. For sticky materials, Teflon lining can be supplied in bag spout, chute and on other surfaces. For corrosive or abrasive materials, stainless steel can be supplied.

For Bulletin 119, circle number 2 on CF's Information Service card, page 51.

## new literature about equipment, materials and supplies

### Spray-on Compound Protects Outdoor Storage Piles

Improved formulations of compounds for protecting outdoor storage piles of bulk materials against loss from wind or rain erosion have been developed by The Johnson-March Corporation. The spray-applied solution contains specially developed additives for maximum coverage and penetration.

The new formulation, Compound SP-301, is a blend of synthetic, organic, long chain polymers in a water base. It forms a thin, tough and durable crust, highly resistant to weathering. Stock piles of sulphur and other materials are currently being protected with the compound. Fluorspar, manganese, bauxite, agricultural limestone, mine tailings and other waste materials represent other uses for the spray.

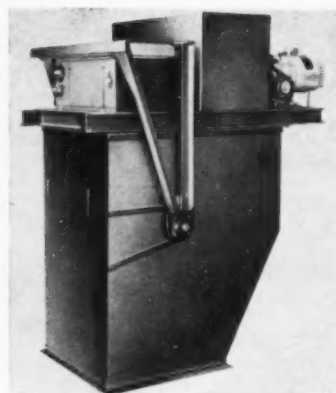
The crusts formed by the sprayed compound reduce the serious economic losses suffered each year through the disappearance of large volumes of valuable material. In addition, community or plant dust nuisances are abated. Protection lasts for periods in excess of a year.

Compound SP-301 is inert, unreactive and non-toxic and without adverse effect on the subsequent processing of sulphur, metal ores, carbon, etc.

Application of the compounds is said to be easily accomplished with any type of spraying equipment from the small portable type up to commercial orchard spraying equipment. The special additives are included to provide proper wetting, penetration and coverage of the surfaces of even the smallest particles on the storage pile.

The solution is supplied in a number of different grades ready to spraying at the rate of one gallon of spray per 100 feet of surface. When desired, a color indicator is included at no extra cost to show where treatment has been made.

For additional information, circle number 3 on CF's Information Service card, page 51.



### Rock Dust Batching Scale

An extremely accurate net weighing scale for rock dust batching, with a capacity of 40 tons of rock dust per hour at an accuracy of  $\pm 1/10$  of 1 percent, has been developed by the Thayer Scale Corporation. It is expected to have widespread application in phosphate rock, and related mineral industries, or in any application requiring large-scale, rapid weighing of fine, dry aggregates and dusts.

The B18R unit consists of a special rotary feeder and a Thayer Flexure-Plate scale which supports a tipping weigh bucket. The patented flexure plate eliminates knife edge pivots and other friction surfaces which would be subject to wear. The new weighing mechanism is said to be unaffected by abrasive dust, dirt, moisture, shock, and temperature changes, and is guaranteed accurate for the life of the scale.

A selector switch on the control box permits manual or automatic operation of the dump cycle. Accessory provisions include a predetermined counter which permits automatic filling and discharging a predetermined number of charges.

The vane type feeder is specially designed for rock dust applications. The rotor shaft is mounted in pillow block bearings located outside of the feeder housing. The bearings are protected from contamination by special seals. Two shut-off gates are positioned by heavy duty air pistons and are gasketed with rubber armor for positive shut-off.

Additional information on the Series B18R feeders and scale may be obtained by circling number 4 on CF's Information Service card, page 51.

### Infrared Comfort Heaters For-Hard-To-Heat Areas

A new line of electric infrared Comfort Heaters for direct radiant heating of hard-to-heat indoor and outdoor areas without costly heating of the intervening air is described in new 8-page, 2-color Bulletin CH-100 available from Fostoria Corporation. Principles, advantages, and typical applications of electric infrared comfort heating are discussed.

For free copy, circle number 5 on CF's Information Service card, page 51.



### New Literature on Combustion Indicators

Hazegage Combustion Indicators—for continuous, accurate and reliable combustion supervision in all sizes and types of boilers—are serving as smoke indicators as well as a dependable way to maintain maximum combustion efficiency.

Red and green lights, included in the instrument panel board, notify the attendant of combustion conditions instantly and provide the information needed to make whatever adjustments or corrections are necessary. Every change in fuel or air adjustment or malfunctioning of furnace, burners or controls is indicated immediately after it occurs so that there is no observation lag. Therefore a CO<sub>2</sub> sampling is unnecessary. These instruments are applicable for new or existing boilers.

For illustrated literature giving further details, circle number 6 on CF's Information Service card, page 51.

### Dry Feeders Brochure

A new brochure which details their 'S' Series Dry Feeders is currently available from Tower Iron Works, Inc. Included in this strictly technical work are charts and graphs showing cubic feet/min capacities of Tower Dry Feeders at various RPM's, design features and the pre-engineered sizes available. Anyone handling chemicals, ferti-

lizer, plastics, ceramics, food products or industrial minerals will find this brochure both interesting and informative.

For your copy of Bulletin DF-602, circle number 7 on CF's Information Service card, page 51.

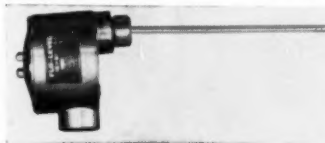
### Probe-type Self-Contained Level Control Announced

A fully self-contained capacitance probe-type material level control for direct mounting on bins, hoppers, tanks or other containers holding dry, semi-dry or liquid materials has been developed by Flo-Tronics, Inc., Electronic Controls Division.

The 'Flo-Level' Model L201 Level Control is provided in both high-level and low-level units. Probe is integral with the explosion-proof control casing. Entire instrument is mounted as one unit at the point of control desired.

Because of its high sensitivity range the L201 has a wide range of level control applications for powdered or granular materials, semi-liquids and liquids.

Presence or absence of material is detected by the probe through changes occurring in the electrostatic field. A signal is given to the control circuit which activates

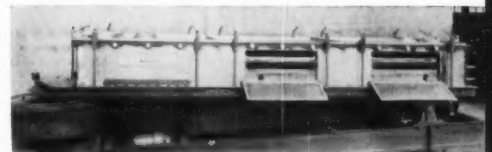


a 2-way fail-safe snap action relay to effect operation of the filling or shut-off device.

A threaded hub on the control permits mounting at any point desired simply by screwing the entire probe and control assembly into a standard pipe coupling attached to the wall of the container.

Standard probe length is 6-inches, with longer lengths available on request. L201 controls are supplied for either 110 or 220 volt power supply.

Additional information may be obtained by circling number 8 on CF's Information Service card, page 51.



### New Machine Cools and Sifts Simultaneously

Development of a new type sifter, which will cool as it sifts, has been announced by Young Machinery Company. The 'Gyro Cooler' is designed to serve in installations where space and time requirements demand cooling and sifting simultaneously.

The Young 'Robinson' gyro cooler employs the enclosed double-balanced drive mechanism. The gyratory motion, at the feed inlet end of the machine, provides maximum contact on the cooler coils and the slight slope and oscillating motion at the discharge end gives continuous flow to the material. Cooling is accomplished by special thermo coils, formed on the underside of the flat 'pan,' which utilize a continuous flow of cold water or brine to carry away the heat from the product. Coils are readily accessible for cleaning through hinged inspection doors. Arrangement of the screens and cooling unit makes it possible to sift and cool, or cool and sift, depending upon the requirements of the process.

Descriptive literature is available by circling number 9 on CF's Information Service card, page 51.

### Reprints Describe Cut In Multiwall Bag Costs

Clupak, Inc. offers reprints of a trade magazine article which tells how Shell Chemical Company cut its multiwall bag costs 7% through the use of Clupak extensible paper bags.

The article discusses Shell's use of the new paper for packaging both fertilizers and resins and also discusses a new Raymond Loewy bag design, giving reasons for the various design elements.

Copies may be obtained by circling number 10 on CF's Information Service card, page 51.

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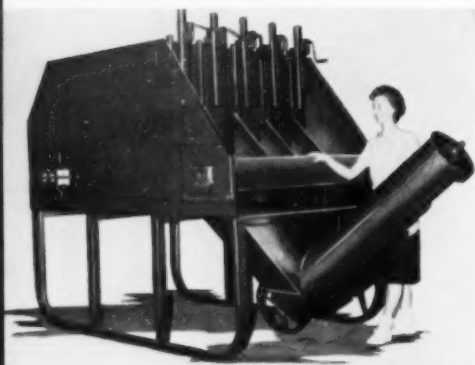
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## —Information Service...



### Blending Unit Recommended For Fertilizer Manufacturers

A new self-contained, completely automatic, one man operated fertilizer mixing plant which manufacturers can add to their present equipment has been announced by Continental Sales Company. The plant can be installed in one week and delivers one ton of fertilizer every three minutes. The fertilizer mixing plan, 'Blend-O-Mixer' is 17' by 5' and the manufacturers say it will mean increased profits of up to \$10 per ton for fertilizer manufacturers.

With the Blend-O-Mixer there's no need for manufacturers to 'sell around' analysis called for by soil tests, according to Continental, as the machine blends any one of thousands of possible formulas, has simple adjustments for different grades, offers minimum segregation of materials and is a real money-maker for fertilizer manufacturers.

The Blend-O-Mixer plant is available in three ways: by purchase and installation as a part of an existing plant; building a plant and installing the Blend-O-Mixer; rental of the Blend-O-Mixer at a normal tonnage charge.

Complete information in a free brochure can be obtained by circling number 11 on CF's Information Service card, page 51.

### Bulletin Describes Pumps For Liquid Fertilizers

The Deming Company announces a new bulletin, No. 850-A, dealing with pumps for liquid fertilizer and 'Morea' liquid feeds.

The bulletin contains complete in-

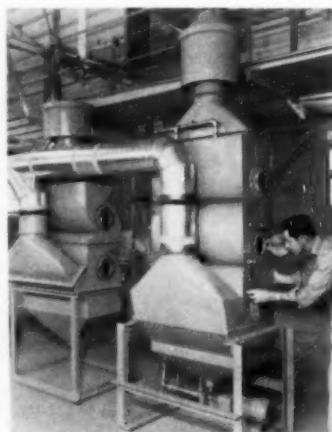
formation on all types of Deming Liquid Fertilizer Pumps. Performance tables, as well as construction information and technical data, are included in this two-color bulletin. Included in the list of uses for these liquid fertilizer pumps are: nurse tank, plant blending, load out, plant storage, acid transfer and transport.

The bulletin contains illustrations and information on internal gear pumps for viscous liquids and 'Morea' liquid feeds.

Bulletin 850-A is available by circling number 12 on CF's Information Service card, page 51.

### New Variable-Orifice Wet Scrubber

A new variable-orifice wet scrubber has been developed by The Johnson-March Corporation. The new Hydro-Volute Scrubber, with air volume control, develops high scrubbing efficiencies on a wide range of fumes, dust and odor problems despite substantial variation of air or gas flow. Scrubbing efficiency of fixed orifice scrubbers



drops off substantially as flow is decreased. The Hydro-Volute is not limited by either high moisture or temperature conditions of the effluent gas.

Both manual and automatic air volume controls are available to assure constant efficiency over wide variations in air flow. In the automatic models, changes in air flow are detected by a differential pressure switch which actuates the modulating control. The Johnson-

March variable orifice scrubber will compensate for changes in air flow of as much as 35 percent from original design capacity.

Hydro-Volute Scrubbers are available in a range of capacities of from 1,000 to 60,000 cfm. Constant or intermittent removal of sludge can be accomplished either manually, hydraulically or mechanically, depending on the need and application. Unit back pressure is low—four and a half inches of water—so that existing fans and blowers can generally handle the additional load. Where necessary, fans can be supplied.

All units from 1,000 to 10,000 cfm include a reservoir, liquid level control, moisture extractor and one or more water-tight access doors as standard equipment. Units above 12,000 cfm are similarly equipped except that no reservoir is required when a settling pond is used. Heavy dust loading and high temperatures necessitate a settling pond. Inlet location is optional.

For additional details, circle number 13 on CF's Information Service card, page 51.

### New Catalog Features Cover-Odors for Products

The new Perfume Catalog of Florasynth Laboratories, Inc., is a comprehensive publication devoted to a wide variety of perfume oils and perfumes' materials manufactured by this firm.

A section of the catalog is of special interest to manufacturers of industrial products. This section contains a large list of Cover-Odors, widely used to mask unpleasant scents in such materials as fertilizers, adhesives, bonded fibres, inks, paints, insecticides, rubber, waxes, solvents and varnishes.

Copies of the Florasynth Perfume Catalog may be obtained by circling number 14 on CF's Information Service card, page 51.

### Sight Flow Indicator

Schutte and Koerting Company has announced a new low-cost Sight Flow Indicator that lets you take a look inside your pipeline to determine if there is flow and the direction and condition of the fluid.

Retaining most of the quality construction features of the company's high-pressure, high-temperature



models, the new 'Flo-Eye'® Indicator has double sight glasses for clear observation of the fluid even under poor lighting conditions. It uses machined recesses and retaining rings for even seating of the sight glass gaskets to prevent leakage.

For more information, circle number 15 on CF's Information Service card, page 51.



### BUSINESS REPLY CARD

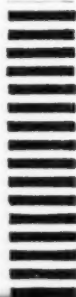
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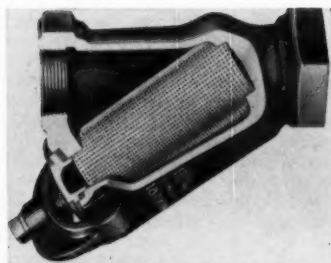
Information Service Bureau

Commercial Fertilizer and Plant Food Industry

75 Third Street, N. W.

Atlanta 8, Georgia





### New Fertilizer Strainer For Liquid Nitrogen

Now available from OPW-Jordan is a new strainer suitable for liquid nitrogen fertilizer. The 1½" #187-AN strainer utilizes a stainless steel screen with 1/32" perforations and an aluminum body to handle the ammonia solutions successfully. The strainer should be used to keep foreign matter from plugging fertilizer nozzles and help to insure an even application on the field. It has a quick opening unit for fast and easy screen removal when cleaning is required.

Accurately machined seats insure that no particles will pass the screen. The composition gasket on the quick opening cap provides a tight seal and stands up very well under ammonia service.

For complete information on the strainer and other liquid nitrogen fertilizer products (Nozzles, Quick Couplers, Swivel Joints, Sight Flow Indicators) shown in free 4 page bulletin F-31R, circle number 16 on CF's Information Service card, page 51.

### Pressurized Bulk Truck Handles Granules, Powders

A new pressurized bulk truck for transport of granular or fine powdered products is announced by Sprout, Waldron & Company, Inc.

Several months of successful operation and exhaustive tests demonstrated that this new self-contained pressurized loading and unloading bulk truck has a definite advantage in chemical and plastic fields.

Free from all belts, conveyors, feeders and airlocks, maintenance costs are greatly reduced and self-cleaning from one load to another is a reality.

The pressurized system permits switching from one product to another without any apparent contamination.

Full details available by circling number 17 on CF's Information service card, page 51.

### New Catalog Describes High Clearance Sprayers

Hahn, Inc., is offering a new and colorful, illustrative 16-page catalog on its line of self-propelled, high-clearance sprayers and accessories. The catalog especially illustrates many uses and benefits of high-clearance ground sprayers for cotton, corn, tobacco, sugar cane and other tall crops. Various spray patterns for weed and insect control, liquid fertilizer applications, and applying chemical defoliants are shown.

For a copy, circle number 18 on

CF's Information Service card, page 51.

### Totally-Enclosed Conveyor Described in Bulletin

Prab Conveyor's brochure, TV-98, shows practical, profit making uses of Prab Tube-Veyor, a totally enclosed bulk handling conveyor which has proven itself in hundreds of applications.

Tube-Veyors feature a two-directional heat treated chain which conveys material in any direction without transfer points, resulting in simplicity, economy and versatility. Two-piece flights allow changes of flights without disassembly of chain. Flight material can be metal or nonmetallic. System is totally enclosed and can be fed and discharged in as many points as desired. High temperature and close quarters are no problem.

For a copy of Brochure TV-98, circle number 19 on CF's Information Service card, page 51.

### Continuous-Flow Conditioner Add Liquids to Solids

A new process material conditioner has been developed by The Johnson-March Corp., that precisely controls the addition of moisture to dry material. The conditioner, called a Verticone, makes possible automatic, accurately controlled and continuous application of liquids to solid particles.

Of particular importance to the chemical processing and other process industries is the ability of the Verticone to add liquids to solids without degradation. The Verticone has application wherever it is desirable to add a liquid to a solid material for the purpose of: (1) introducing a specified moisture content; (2) coating of granules or flakes or application of dyes or coloring material; (3) pre-wetting or tempering; (4) making suspensions; (5) rendering a stream of dry materials dust-free.

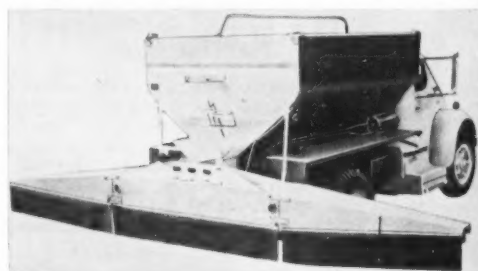
Application of liquid to solid particles by means of the Verticone conditioner can be made at any point in a process system.

Rapid, continuous and effective conditioning can be obtained only by proper dispersion of the solid stream of material. This is accomplished by introducing the material onto a distributing cone at the top of the Verticone. The material falls over the cone and leaves the base of the cone in the form of a thin-walled (between ¼" to ¾" thick) hollow cylinder.

A system of sprays inside the hollow cylinder of falling material applies the solution so that all the surfaces of the solids are properly coated. The treated material can drop directly onto a chute or conveyor or into other processing equipment or discharged by means of a rotary table feeder. There is nothing in this process that degrades the product.

For complete information on the Verticone, circle number 20 on CF's Information Service card, page 51.

## —Information Service...



### New Fertilizer Spreader Offers 24, 40, 50-Foot Swaths

A new bulk fertilizer spreader engineered to increase spreading accuracy and lessen maintenance and service problems has been announced by Simonsen Manufacturing Company.

This model 'P' spreader new design features include a 16" wide, stainless steel heavy-duty apron, and a modern stainless steel micrometer adjusting screw to allow easier setting of stainless steel metering gate.

Also, the model 'P' will be available in three different spreading widths—24, 40 and 50 feet. New 'T' beam sills support the hoods as well as increase the body strength. A single distributor fan is standard equipment, with twin fans offered as optional equipment.

The model 'P' bulk fertilizer spreader is 10 feet long—has a capacity of 225 cu. ft., or seven tons, and has a rate of spread of from 75 lbs. and up per acre.

For full information on this new model 'P' Spreader, circle number 21 on CF's Information Service card, page 51.

### Reinforced Plastic Tank For Fertilizer Application

A former liquid fertilizer mixer now offers sprayer tanks made from reinforced 'Laminac' polyester resins. One model manufactured by The Farmwell Co., the corrosion-resistant 'Farmaster' tank for spraying insecticides, weed killers and fertilizer, is claimed to provide the same advantages as stainless steel tanks, but at half the cost. Extra important advantages of its own are lighter weight, and resistance to acids, esters and salts. The tanks are made in 100, 150, 200 and 300-gallon sizes, and are trailer-mounted behind a tractor. The spraying apparatus is incorporated into a boom that can be folded for transporting or storage. Because of the tanks' greater capacity, farmers can now cover ten acres per hour.

For full information, circle number 22 on CF's Information Service card, page 51.



## —Information Service...

### New Revised Specifications For Test Sieves

A bulletin covering 1960 revised specifications for testing sieves with particular emphasis on Tyler Standard Screen Scale is available from The W. S. Tyler Company. The bulletin also embodies the new A.S.T.M. specifications E-11-60-T as well as those proposed as international standards.

The new specifications combine the former coarse and fine series into a single series and are compatible with the old U.S. Series E-11-39. Both the old and new series are also compatible with the Tyler Standard Screen Scale Series since

the only difference is in the identification method.

In view of the compatibility between the U. S. and Tyler sieves, they can be used interchangeably in making and reporting test results.

Free copies of Bulletin No. 608, describing Laboratory Equipment are available by circling number 23 on CF's Information Service card, page 51.

### All-Aluminum Tank Truck For Fertilizer Solutions

The Heil Company has developed a new type all-aluminum tank truck for chemical and food products.

Believed to be the first aluminum

tank designed for pressure unloading, the 6,000-gallon-capacity tank can be unloaded quickly at 35 pounds of pressure. It was designed specifically to haul such products as fertilizer solutions, petroleum products, transmission oil, animal greases and fats, molasses, vegetable oils or resins.

Heil Company points out that the aluminum construction permits a four to six per cent increase in payload. They say the aluminum makes painting unnecessary and virtually eliminates maintenance. The skirting and hose tubes also are of aluminum.

The truck consists of an inner tank of 5052 aluminum alloy sheet, an outer jacket of the same alloy, and three inches of fiberglass insulation between. The inside of the tank is smooth bore, with no internal structural members or lining, making it easy to clean. The company also is making similar insulated tanks to individual specifications.

For complete information on the new tank truck, circle number 24 on CF's Information Service card, page 51.

### New Bag Closure Equipment Available Industry-Wide

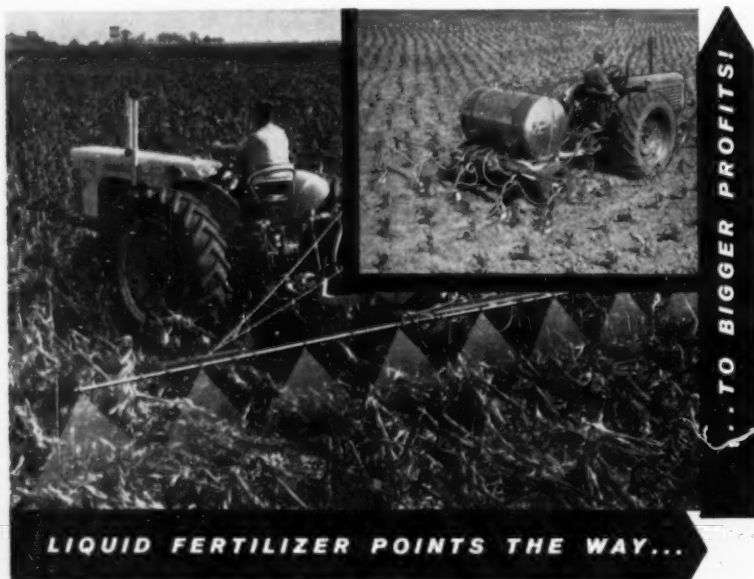
Manufacturers and users of multiwall bags will now be able to apply in their own bag plants the new, 4-ply, double-strength sewn closure ImpacTape as the result of modification equipment developed by West Virginia Pulp and Paper Company.

The ImpacTape modification equipment has been specially designed for both H and E heads of Union Special Series 80600 sewing machines. It is being offered to bag users for a small token fee, and to bag manufacturers for a modest annual payment. The company has applied for a patent on the ImpacTape closure produced by the new equipment.

The company is offering ImpacTape modification equipment to paper bag users on payment of an initial fee of only \$10. Paper bag manufacturers, regardless of how many millions of bags they make each year, will be able to use the equipment for a modest annual charge of \$250.

The modification equipment itself is charged for at cost, which varies according to the type of sewing machine head used. For the H head, the installation charge is \$50. For the E head, the charge is \$250. These charges cover such items as tape formers, adapter plates, brackets and tape stands. In the case of the E head, it also includes semi-automatic solenoid mechanism which activates tape cut-off knives. The first ImpacTape mechanism was recently installed in a customer's plant in the short time of fifteen minutes, between work shifts, and is now operating with complete satisfaction.

For complete details, circle number 25 on CF's Information Service card, page 51.



LIQUID FERTILIZER POINTS THE WAY...

WITH TRYCO'S  
COMPLETE  SERVICE

You'll find today's biggest potential in liquid fertilizers . . . the business that makes a double profit for you on almost every sale because you sell it *and apply it* for the majority of your customers.

In the last two years alone, liquid fertilizer plants have doubled and dealers like yourself report sales as high as 100 tons of liquid to every ton of dry. Their customers get better results for less . . . boost dealer sales and profits.

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Like other successful operators, you'll find it most convenient and profitable to supply all your needs from one all-inclusive source. That's why Tryco offers a more complete line of equipment than any other organization . . . all the way from storage tanks and nurse tanks down to transfer pumps, fiberglass tanks, hose, and nozzles.

If you're interested in finding out more about the liquid fertilizer profit potential in your area, phone or write us now. We'll be glad to give you complete details on the economical equipment you'll need, sources of supply, and getting a profitable liquid business started.



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Big Chief Kay-Two-Oh is headed back to Manhattan Island. It's not that the Paleface has decided to give Manhattan back to the Indians . . . just that the Chief feels that he can better serve his many customers from new sales offices in a towering tepee in the heart of the asphalt jungle.

You are cordially invited to drop by for a few puffs on the peace pipe whenever you are in the neighborhood, but at any time remember that the P.C.A. Chief's services are as close to you as your nearest tom-tom. Call New York, LT 1-1240, or TWX NY - 1 - 5386. If you've got a problem the Chief can help you solve, he's always glad to tell you "How".

As of February 1, our General Sales Office will be located at:  
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**POTASH and SERVICE**

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## POTASH COMPANY OF AMERICA

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Midwestern Sales Office: First National Bank Building, Peoria, Illinois

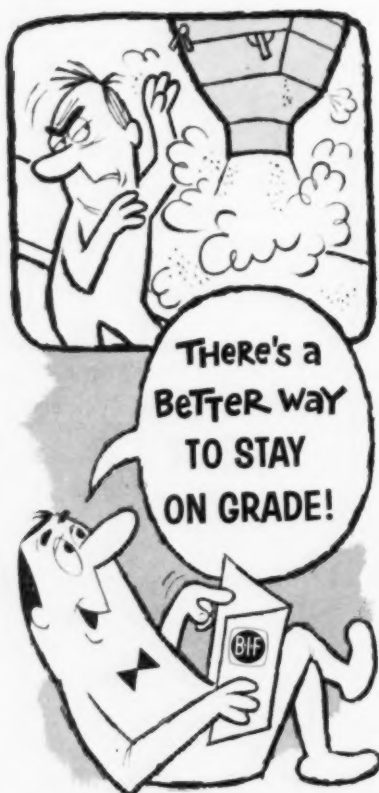
Southern Sales Office: 1776 Peachtree Building, N.E., Atlanta, Georgia

Canadian Sales Office: 2 Carlton Street, Toronto 2, Ontario

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## -of This and That . . .

Many of CF's readers will recognize immediately the man in the hospital bed as Vernon Gornto who was a wheel in the Fertilizer Industry's Safety Section of NSC from its inception. Vernon has been hospitalized for several weeks following a serious operation for removal of a malignant growth. But his doctors have assured him that his complete recovery is a certainty and now just a question of time. As Vernon says, "I have, along with Arthur Godfrey and many others, been fortunate enough with the help of the Good Lord and the skill of my surgeons to lick the dreaded disease of cancer." . . . We are of the opinion that Miss Kenny, R.N., also had something to do with it—in fact, when we saw this picture, our first comment was "Wouldn't you know Vernon would have the prettiest nurse in the hospital?" (P.S. to Miss Kenny: Since Vernon is doing so well, maybe you'd better start wearing your track shoes) . . . Vernon would love to hear from his friends—write him. Following his retirement from Smith-Douglass, Vernon started his own company, is now president of Insurance Unlimited (if it's insurance, they write it) at 303 Kresge Bldg., 236 Granby St., Norfolk 10, Va.



We read with much interest about Raoul Allstetter, National Plant Food Institute veep, serving as vice chairman of the Inaugural Housing Committee which was responsible for finding housing for the tens of thousands of people who attended the inauguration in Washington in January. This included securing a place to stay for over 4,000 members of 40 civilian bands, etc. from all over the U. S. . . . Raoul's comment: "??/xy!!!" (We're kidding—we don't know what he said.)

Which reminds us of this story: The supervisor of a railroad received the following report from one of his track foremen: "I am sending in the accident report on Casey's foot, where he struck it with a sledge hammer. On the form, under 'Remarks', do you want mine, or do you want Casey's?"

E. A. Geoghegan, of New Orleans, president Wesson Division, Hunt Foods and Industries and exec.-v.p. of Hunt Foods, and president of Southern Cotton Oil Div., has been elected a director of The National Bank of Commerce in New Orleans. Also, Eddie currently serves as director of: NPFI, National Cottonseed Products Association, the Grocers-Manufacturers Association, and Eureka Homestead in New Orleans.

George Dunklin, exec.-manager of Planters Fertilizer and Soybean Co., Pine Bluff, Ark., was recently installed as president of the Pine Bluff Chamber of Commerce.

John A. Miller, former president of Price Chemical Company, is heading the "A" division in Louisville's Red Cross Drive. He is president of Cave Hill Cemetery and chairman of Broadway Baptist Church Trustees, both in Louisville.

Edward G. Cole, Jr., president, R. D. Cole Manufacturing Co., Newnan, Ga., was elected president of the Steel Plate Fabricators Association of Chicago at their annual meeting in Fort Lauderdale, Fla.

John R. Riley, president of Southern Nitrogen Co. recently stated that the previous surplus capacity in nitrogen has now been largely absorbed and more capacity must be built in the 1960's to meet anticipated demand.

Dr. Malcolm H. McVickar, chief agronomist, California Chemical Co., has authored an up-to-date edition of *Using Commercial Fertilizers*. New chapters have been added covering special uses for fertilizer, fertilizer-pesticides mixtures, fertility-moisture relationships, and the economics of fertilizer. A chapter on liquid fertilizer, description of new materials, their manufacturing processes and agronomic merits, and other chapters which have been expanded to cover new developments in the industry since the first edition was published nine years ago, are also a part of the new edition.

Clinton L. Chapman, known as the Univ. of Wisconsin's "Mr. Fertilizer" who retired last November, was recently honored at a dinner commemorating his contributions to the University and to agriculture. More than 175 of his colleagues, extension men and fertilizer industry representatives attended the dinner. R. W. Scanlan, Phillips Chemical Co., spoke for the fertilizer industry. "Chappie" plans to continue his soils work on a consultant basis and to continue growing flowers. The front yard of his home in Madison is filled with blooms from early spring to late fall.

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He's one of several hundred Cyanamid people who mine, process, research, deliver and service phosphatic materials for your acidulation and mixed fertilizer business. These people put Cyanamid's more than 40 years of phosphate experience into products and services you can use.

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**Technical Service:** Cyanamid's staff of technical experts are constantly at your service. Make your formulation and production problems theirs. That's their job.

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## Products you can use

Cyanamid's phosphate business is the mining and manufacturing of the highest quality products for your mixed fertilizer requirements.

- Florida Natural Phosphate Rock.
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- Phosphoric acid — an economical source of  $P_2O_5$  for high analysis fertilizers.

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FOR  
1961...  
AND  
BEYOND



## Fertilizer industry goals rate priority planning at SOHIO

Sohio's success depends upon a healthy, vigorous fertilizer industry. That's one of the reasons why Sohio lends full support to these goals that will benefit you and your company:

- Improvements in fertilizer technology and new developments in manufacturing.
- Advances in chemical control methods.
- Educational and public relations programs that benefit both the fertilizer industry and agriculture.
- Encouraging research in soil science,

agronomy, fertilizer economics and related fields.

These goals have always rated priority planning at Sohio. They are the key to our thinking in providing products and services for you.

Call the "Man from Sohio" for details on Sohio SERVICE and a complete line of nitrogen materials: high-quality anhydrous ammonia . . . aqua ammonia . . . 45% coated or 46% uncoated urea . . . 18 nitrogen solutions, including all urea types.



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A-7

# Association Activities

## COMING

**March 27-28: The CFA Soil Improvement Committee** announces the 9th annual California Fertilizer Conference, on the Kellogg Voorhis Campus, California State, Pomona. The program will feature micro-nutrients and nitrogen.

**April 6-7 Louisiana:** Foresters and others in allied fields will attend the 10th annual Forestry Symposium, Louisiana State, Baton Rouge. The broad subject, "Advances in Management of Southern Pine."

**June 5-7 Southern Control Officials** will get together in Kentucky for the first time in 20 years, Bruce Poundstone, secretary-treasurer for 10 years, is now president. The meeting will be of special interest to the plant food industry.

**June 11-14:** The National Plant Food Institute's annual convention will be held at The Greenbrier, White Sulphur Springs, West Virginia. Program details will be announced later.

**August 16-20:** the Canadian Fertilizer Association convention will be held at Manor Richelieu, Murray Bay, Quebec.

**October 4-6:** The Southeastern Fertilizer Conference, at the Biltmore Hotel, Atlanta, Ga.

**October 12-13:** the Northeastern Fertilizer Conference will be held at

the Schine Inn, Chicopee, Massachusetts.

**October 29-November 1:** National Agricultural Chemicals Assn. will hold their 28th annual meeting at The Homestead, Hot Springs, Virginia.

**October 30-November 1:** The National Fertilizer Solutions Association will meet at Edgewater Beach Hotel, Chicago. The Association's board of directors, meeting at Chicago last month, voted Miami, Florida as the site of the 1962 convention.

**November 12-14:** California Fertilizer Association will hold its 38th annual convention at the new Jack Tar Hotel, San Francisco. This hotel is already taking reservations. For details, write the Association at 719 K Street, Sacramento 14, California.

## HELD

**Colorado** The Rocky Mountain Plant Food Association at their annual meeting in Fort Collins, elected Ed McMillan, Spencer Chemical, president; R. E. Montieth, Simplot Soil-builders, vice-president; Bill Griffith, Phillips Petroleum, secretary-treasurer.

**Idaho** The Inland Empire Area short course held in January drew nearly 500 people to the six meetings con-

## EASTERN IDAHO

Keith Campbell, Western Phosphates agronomist, points out the profits to be obtained from the proper fertilization of alfalfa to Wilbur Brown, President of Eastern Idaho Plant Food Association; B. L. Brown, J. R. Simplot Co.; Jack Wursten, past president, E. I. P. F. A. At a recent meeting the Association pledged the members to cooperate with the Idaho Extension Service in putting out fertilizer demonstration plots in conjunction with the Tri County Intensified Soil Fertility Project.



## WISCONSIN

Officers of the newly-formed Wisconsin Fertilizer Association are shown here. Left to right they are Ray L. Pavlak, Deerfield, of Dairyland Fertilizer Co., Vice Chairman; R. B. Baldrige, Stevens Point, of Kickapoo & Badger Brand Fertilizers, Chairman; W. M. Imhoff, Madison, of Farmco Service Co-op, Secretary Treasurer. Membership to the Association is open to the fertilizers manufacturers in the State and the group seeks to encourage research and promote the use of fertilizers.

ducted by the various universities, and sponsored jointly by Northwest Plant Food Association and the University of Idaho extension service.

**Illinois Fertilizer Industry Group—**some 150 strong—met at the University February 2 to hear University agronomists discuss latest research results and properties of Illinois soils.

**Illinois Liquid Fertilizer Manufacturers Association,** meeting in Jan-

## ILLINOIS

New Officers talk about plans for the coming year with Sam R. Aldrich (second from left), University of Illinois agronomist, at the Illinois Fertilizer Conference held on the University campus, Urbana, February 2, 1961. The new officers are: vice-chairman, R. M. Morehead, representing Olin Mathieson, St. Louis, Mo.; Aldrich, on the Association's advisory committee; chairman, John Abbott, Ashkum Fertilizer Company, Ashkum; a newly elected director, Robert E. Weis, Virginia-Carolina Chemical Corporation, East St. Louis; (standing) treasurer, Harold L. Stangel, Darling & Company, East St. Louis; and, secretary, Roy B. Nethery, Federal Chemical Company, Danville. Robert E. Weis is the organization's past chairman.





WEST

Plans for joint action on certain projects of mutual interest were discussed by representatives of the California Fertilizer Association and the National Plant Food Institute recently in San Francisco. As shown from left to right, back row are: Sidney H. Bierly, general manager, C.F.A., Sacramento; Dr. Richard B. Bahme, Western director, NPFI; front row: Ed Gould, Chairman, C.F.A. Soil Improvement committee and Shell Chemical Company, San Francisco; and Dr. M. H. McVickar, Chairman, NPFI Western research and education committee and California Chemical Company, Richmond. Forest fertilization, range fertilization and fertilizer safety are to be jointly sponsored in California by the C.F.A. and the NPFI.

uary initiated an effort to have the state set up a commission to study the fertilizer laws "so that we can be sure the farmer is getting what he pays for. Ernest Harper of Aylco Chemical Corp., Sullivan, was elected president; Loren Hopwood of Indian Point Farm Supply, Athens, was elected vice president. The group elected James Merriman, Merriman Fertilizer Service, Monticello, as secretary-treasurer and Mrs. Merriman as executive secretary.

**New Jersey** Plant Food Educational Society, meeting during the Rutgers fertilizer-lime meeting, moved up James W. Carroll of Chamberlin-Barclay to president of the society, vice president; Wallace Mitchetree, Rutgers, vice-president; C. A. LuBow, Star Fish and Bone Fertilizer Co., treasurer; Dr. Stacy B. Randle, Rutgers, secretary. New board members include Francis R. Raymaley, American Cyanamid and George Serviss, GLF.

**Pennsylvania** Lime and Fertilizer Conference at Penn State February 8-10 featured the chart which permits reading of fertilizer analyses in terms of plant nutrients. This was developed by Dr. W. Wayne Hinrich, extension agronomist and president of the Pennsylvania Plant Food Educational Society.

## Industry Meeting Calendar

DATE	EVENT	LOCATION	CITY
Mar. 27-28	California Fertilizer Conference	Kellogg-Voorhis Campus	Pomona
June 11-14	National Plant Food Institute	The Greenbrier	Wh. Sul. Spgs., W. Va.
June 27-29	Pacific N.W. Fertilizer Conference	Marion Hotel	Salem, Ore.
July 19-21	Southwest Fertilizer Conference	Galvez Hotel	Galveston, Tex.
Aug. 16-20	Canadian Fertilizer Association	Manoir Richelieu	Murray Bay, Que.
Oct. 4-6	Southeastern Fertilizer Conference	Biltmore Hotel	Atlanta, Ga.
Oct. 12-13	Northeastern Fertilizer Conference	Schine Inn	Chicopee, Mass.
Oct. 30-Nov. 1	National Fertilizer Solutions Assn.	Edgewater Beach Hotel	Chicago, Ill.
Nov. 2-3	Pacific N.W. Fertilizer Assn.	Gearhart Hotel	Gearhart, Ore.
Nov. 8-10	Fertilizer Industry 'Round Table'	Mayflower Hotel	Washington, D. C.
Nov. 12-14	California Fertilizer Association	Jack Tar Hotel	San Francisco

**Washington's** Odessa saw more than 300 wheat farmers gather February 2 to hear a review of events past, and a forecast of the future in the

use of fertilizer for wheat. Soil testing, cause of deficiencies, irrigation, varieties—these were among the subjects.

## Slight Decline Shown in Domestic Potash Deliveries

Deliveries of potash for agricultural purposes in the United States, Canada, Cuba, and Puerto Rico by the eight principal American producers and also the importers totaled 3,953,505 tons of salts containing an equivalent of 2,305,212 tons  $K_2O$  during 1960, according to the American Potash Institute. This was a decrease of about 1% in salts and  $K_2O$  under the same period in 1959. Continental United States took 2,138,237 tons  $K_2O$ ; Canada, 99,495 tons; Cuba, 23,250 tons; Puerto Rico, 21,350 tons; and Hawaii, 22,880 tons  $K_2O$ . These figures include imports from Europe of 272,884 tons  $K_2O$ . Exports to other countries were 428,279 tons  $K_2O$ , an increase of nearly 38%. Deliveries of potash for non-agricultural purposes amounted to 151,274 tons  $K_2O$ , an increase of 3% over 1959. Total deliveries for all purposes were 4,909,440 tons of salts containing an equivalent of 2,884,765 tons  $K_2O$ , an increase of more than 3% in salts and  $K_2O$ .

Potash for agricultural purposes accounted for 95% of deliveries. Muriate of potash continued to be by far the most popular material comprising 94% of agricultural potash. Of the muriate, standard grade was 1,439,166 tons  $K_2O$  while granular muriate was 1,122,450 tons, a decrease of 2% in the standard and an increase of 12% in the granular grade compared to 1959. Sulphate of potash and sulphate of potash-magnesia accounted for 6% of agricultural deliveries.

In continental United States, ag-

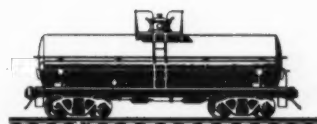
ricultural potash was delivered in 46 states and the District of Columbia. Illinois with over 200,000 tons  $K_2O$  was the leading state followed in order by Indiana, Georgia, and Ohio, each taking more than 160,000 tons  $K_2O$  during the year. Due to shipments across state lines, consumption does not necessarily correspond to deliveries within a state.

During the fourth quarter of 1960, deliveries for agricultural purposes were 605,551 tons  $K_2O$  in continental United States; 37,172 tons in Canada; 8,033 tons in Cuba; 4,390 tons in Puerto Rico; and 6,673 tons in Hawaii; making a total of 661,828 tons  $K_2O$ , a decrease of 2% under last year. These figures include imports from Europe, July thru December. Exports of potash to other countries during the fourth quarter were 117,630 tons  $K_2O$ , an increase of 11,251 tons or 11% over last year. Deliveries of potash for non-agricultural purposes were 34,951 tons  $K_2O$ , a decrease of 11%.

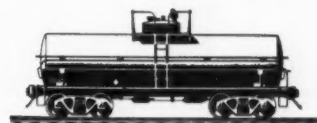
In addition to the regularly reported deliveries on the quarterly basis, information from governmental and other sources indicates that during July thru December, 1960, there were imports of European potash into the United States, Canada, Cuba, and Puerto Rico of 81,201 tons  $K_2O$  as standard muriate of potash, 19,527 tons of granular, and 21,459 tons  $K_2O$  as sulphate of potash, making a total of 122,187 tons  $K_2O$ . These figures are included in the deliveries for the fourth quarter.

# 5

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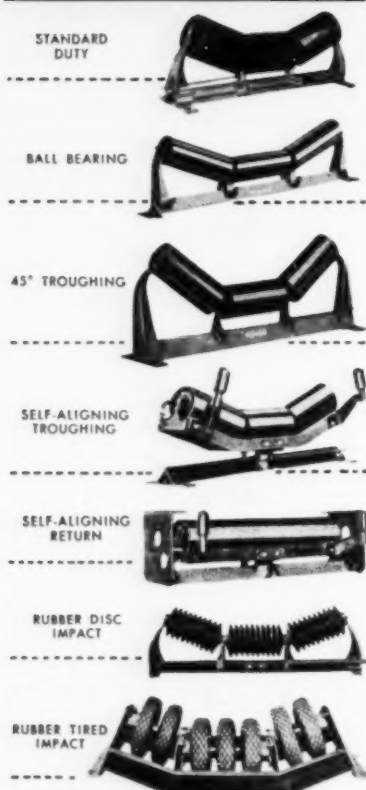


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## Number of Co-ops Declining

## But Volume and Membership Rise

The latest annual survey of farmer cooperatives just completed by Farmer Cooperative Service, U. S. Department of Agriculture, indicates that there was a substantial increase in dollar volume, a small increase in memberships, and a continuation of the downward trend

in number of cooperatives in 1958-59.

Gross business volume of farmer cooperatives showed an increase of more than 8 percent in 1958-59 over that of the preceding fiscal year. This volume, which included inter-cooperative business, reached over

Estimated number of cooperatives, memberships, and business of marketing, farm supply, and related service cooperatives, by states, 1958-59

State	Number of cooperatives with headquarters in State	Number of memberships in State	Net business (excludes intercooperative business)
Maine	20	22,600	\$1,000
New Hampshire	9	8,245	46,132
Vermont	30	20,175	22,348
Massachusetts	39	27,540	77,232
Rhode Island	3	3,950	69,455
Connecticut	29	15,535	9,116
<b>New England</b>	<b>130</b>	<b>98,045</b>	<b>51,183</b>
New York	413	153,350	275,466
New Jersey	71	33,675	555,466
Pennsylvania	185	177,125	136,445
<b>Middle Atlantic</b>	<b>669</b>	<b>364,130</b>	<b>360,909</b>
Ohio	285	382,325	1,052,820
Indiana	142	427,345	584,891
Illinois	500	502,365	419,966
Michigan	229	193,460	705,976
Wisconsin	723	391,070	355,503
<b>East North Central</b>	<b>1,879</b>	<b>1,896,565</b>	<b>633,794</b>
Minnesota	1,226	603,085	2,700,130
Iowa	653	408,740	829,885
Missouri	251	422,545	660,488
North Dakota	519	266,105	299,415
South Dakota	315	183,410	323,198
Nebraska	399	252,880	197,302
Kansas	354	193,215	311,921
<b>West North Central</b>	<b>3,717</b>	<b>2,329,980</b>	<b>357,456</b>
Delaware	17	28,475	2,979,665
Maryland	63	96,785	36,904
Virginia	155	269,080	102,663
West Virginia	78	77,580	194,221
North Carolina	117	414,490	48,137
South Carolina	37	75,120	178,960
Georgia	83	172,695	38,585
Florida	111	42,840	112,874
<b>South Atlantic</b>	<b>661</b>	<b>1,177,065</b>	<b>276,644</b>
Kentucky	102	226,040	988,988
Tennessee	136	139,325	134,912
Alabama	49	91,480	94,152
Mississippi	148	135,400	59,849
<b>East South Central</b>	<b>435</b>	<b>592,245</b>	<b>157,201</b>
Arkansas	113	86,910	446,114
Louisiana	56	24,555	107,957
Oklahoma	183	178,475	47,770
Texas	511	172,915	195,754
<b>West South Central</b>	<b>863</b>	<b>462,855</b>	<b>550,475</b>
Montana	182	69,125	901,956
Idaho	99	67,050	125,791
Wyoming	23	12,245	104,028
Colorado	114	63,090	24,606
New Mexico	35	11,565	166,569
Arizona	13	65,900	43,700
Utah	72	29,540	67,543
Nevada	4	360	92,592
<b>Mountain</b>	<b>542</b>	<b>318,875</b>	<b>3,514</b>
Washington	188	116,585	628,343
Oregon	118	69,890	331,301
California	437	130,975	181,606
<b>Pacific</b>	<b>743</b>	<b>317,450</b>	<b>1,192,646</b>
<b>Total (48 States)</b>	<b>9,639</b>	<b>7,557,230</b>	<b>1,705,553</b>
Alaska	2	100	7,118
Hawaii	17	1,220	7,779
<b>United States</b>	<b>9,658</b>	<b>7,558,550</b>	<b>11,693,932</b>

\* Preliminary.

\$15.2 billion as compared with \$14 billion the previous year.

The total number of memberships was 7,558,550, an increase of 72,095 memberships over the previous year.

Total number of marketing, farm supply, and related service cooperatives decreased to 9,658 as compared with 9,735 in the preceding year.

Total net business, excluding intercooperative business, was almost \$11.7 billion—an increase of 9.2 percent. Dairy products continued to rank first in volume among products marketed and feed was first among production supplies sold.

Minnesota continued to hold first place in number of associations and memberships, but California again ranked first in total dollar volume of business.

Seventy-seven percent of all farmer cooperatives—an increase of 1 percent—handled one or more farm supplies. Seventy-one percent of all cooperatives—the same percentage as in the previous year—did some marketing. Ninety-three percent of all cooperatives—an increase of 1 percent—supplied current data for the survey.

The increase of more than 8 percent in the total gross dollar volume of cooperatives reflects both the rise of 1.7 percent in the average index of prices received by all farmers and the 6 percent rise in the average index of prices paid by farmers for the fiscal year July 1958 through June 1959, compared with those of the preceding fiscal year.

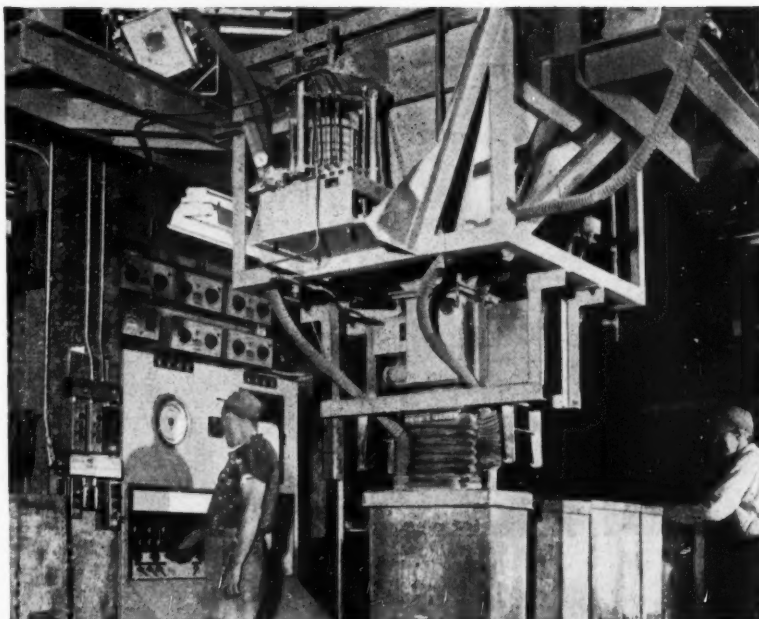
The loss of 77 associations in the number of farmer cooperatives was largely due to mergers and consolidations. This is a continuation of the trend noted in the past several years.

The increase in memberships, although slight, is significant because it shows that the decreases cited in the two preceding years have been checked. Those decreases were credited to the decline in total number of farmers. Membership figures contain duplication, as many farmers are members of more than one cooperative and may be counted more than once. Current reporting methods do not permit elimination of this duplication.

Feed was first among production supplies with \$896 million net value; petroleum products, second with \$580 million; and fertilizer, third with \$314 million. All farm supplies showed increases over the previous year.

In number of cooperatives, Min-

## AT CARBORUNDUM...



### Accuracy and Instantaneous Control Response with W & C BATCH-WEIGHING SYSTEMS

Critical formulation standards are maintained at lower cost since Carborundum Company has introduced automatic batching of ingredients at their Perth Amboy, N. J. refractories manufacturing plant. The new automatic system—designed with W & C pre-engineered and laboratory-tested "building block" components—has greatly increased production, reduced labor costs, and decidedly improved the accuracy of batch weight control.

Chief reason for the accuracy of W & C Batch-Weighing Systems is the patented Uniforce flexural frame used in supporting both weigh-hoppers and weight transmitters. These unique flexural frames ensure accurate weighing under *all* load conditions, resolve *every* force and moment into a single vertical component applied to the load transducer.

Immediate response to control material flow in *any* batching operation is provided by the W & C Pneumatic Weight Transmitter, a force-balance instrument delivering a highly reproducible, (1 part in 2000) almost *instantaneous* signal directly proportional to net weight. No possibility of overshooting specified ingredient quantities. Practically no maintenance, compared with mechanical systems. The W & C scale is dynamically faster than a beam-and-balance or flexural beam system... W & C uses air, has no inertial mass to overcome... comes into balance sooner than a mechanical system.

For *consistently* accurate reproduction of bulk material formulations in any batching operation—single ingredient weighing to sequential multi-ingredient proportioning—you can depend on W & C.

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Bulletin 30 fully describes W & C Batch-Weighing Systems  
Bulletin 14 describes other W & C Automatic Weighing Systems

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CONTROL PANELS

See page 644 Chemical Engineering Catalog for list of representatives.



## Weighing & Controls, Inc.

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Industrial Park, E. County Line Road, Hatboro 10, Pa.

Estimated business in specified farm supplies by cooperatives, 1958-59<sup>1</sup>

Item	Number of cooperatives handling	Gross business (includes intercooperative business)	Net business (excludes intercooperative business)
		\$1,000	\$1,000
Supplies purchased for patrons:			
Building materials	1,672	127,116	87,387
Containers	1,147	56,669	28,681
Farm machinery and equipment	1,955	108,749	76,246
Feed	4,581	1,222,317	895,555
<b>Fertilizer</b>	<b>4,391</b>	<b>518,000</b>	<b>314,268</b>
Meats and groceries	953	62,841	52,513
Petroleum products	2,839	930,356	580,150
Seed	4,001	135,826	97,374
Sprays and dusts (farm chemicals)	2,832	70,118	47,075
Other supplies	4,716	317,930	191,812
<b>Total farm supplies</b>	<b>7,406<sup>2</sup></b>	<b>3,549,922</b>	<b>2,371,061</b>

<sup>1</sup> Preliminary. Includes Alaska and Hawaii.

<sup>2</sup> Adjusted for duplication arising from multiple activities performed by many cooperatives.

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nesota was first with 1,226; Wisconsin was second with 723; and Iowa was third with 653.

In number of memberships, Minnesota and Illinois retained their first and second places with 603,085 and 502,365, respectively.

California, with a combined marketing, production supply, and service business of almost \$1.2 billion, or over 10 percent of the total net volume, outranked all other states. Minnesota remained second with almost \$830 million, and Illinois was third with \$706 million net volume.

Iowa was first in net value of farm supplies handled, with over \$156 million; Minnesota, second with \$154.3 million; and New York, third with \$149.4 million.

### Automation Coming For Mixing and Blending

Mixing and blending, such as in the fertilizer field, has long been an "art" but may succumb to automation, the American Institute of Electrical Engineers was informed.

"The recent development of digital control computers and of new types of sensors (such as the X-ray analyzers) have made possible the application of the techniques of automation to blending processes," G. E. Adams, General Electric Company, Phoenix, Ariz., reported in a paper, A Study Of A Generalized Model For Digital Computer Control of Blending Processes.

### Heptachlor Cleared For Alfalfa

Heptachlor has been released for use on alfalfa to control alfalfa weevils. The U.S.D.A. accepted a new Heptachlor label for western United States on February 2. Their approval is based on extensive data showing that no residue of Heptachlor or Heptachlor epoxide is present in alfalfa hay when Heptachlor is applied according to the recommendations.

### Fleet Leasing Study Free

A third revised edition of a 28-page study on the pros and cons of leasing auto fleets by industry has just been issued by the Foundation for Management Research. Two earlier editions have been completely distributed.

Single free copies of this study may be obtained by executives by writing to the Foundation for Management Research, 121 West Adams Street, Chicago 3, Illinois.

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## Fully-Automated Order Handling

### Paces IMC's New Program

A fully-automated order handling system has been introduced by International Minerals & Chemical Corporation as the major feature of a full-range customer service program designed to help fertilizer manufacturers during the heavy production season.

Speed in order handling and delivery, technical assistance held ready on a standby basis in all sections of the country, and an 'advance loading' program based on recently completed industrial engineering studies, are all a part of the program, according to L. W. Gopp, IMC vice president in charge of sales. He said the program represents a refinement of accepted practices and the introduction of several unique features.

"This is the production season phase of our year-round customer service program," he explained. "During eight or nine months of the off-season we concentrate on supplying services which will help put the manufacturer in position to realize the most sales when the sell-

ing season arrives. When it gets here we concentrate on helping him achieve production for top sales by assuring him promptest possible delivery of raw materials and special technical assistance where needed." Marketing assistance in the form of a kit, 'How to Make Sales Today,' is currently being distributed to manufacturers.

Mr. Gopp said the new automated order handling system cuts down delivery time on potash by as much as three days. The plan enables the order and waybill to be flashed immediately upon receipt to the appropriate plant and railroad, with both plant and railroad scheduling activity on the order within 30 minutes. Waybill and acknowledgment go to the customer simultaneous with the plant-railroad notification.

Preparation for the rush delivery schedule extends from IMC potash and phosphate production points through every possible distribution channel.

Stockpiles of phosphate and pot-

ash have been established in warehouse at strategic points throughout the country and will be replenished as orders deplete them.

Barges of phosphate and triple superphosphate are spotted at various Mississippi River points and others will move up from the Gulf to serve as floating warehouses once the rush is on, he said.

Preparations have been made at all loading facilities for 24-hours-a-day, 7-days-a-week loading during the rush period, according to David J. Stark, production vice president for IMC agricultural chemicals.

Mr. Gopp explained that findings of a recently completed industrial engineering study would allow loading of many cars in advance of orders, and that some shipments will even be on the way before the orders are received.

"This involves use of the 'rollers' technique," he explained, "by which unconsigned freight cars are shipped into an area to be diverted when the customer order comes in."

IMC's technical service staff will be freed from routine assignments and held on a standby basis during the rush period to answer emergency calls for help, according to Mr. Gopp.

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**SITUATION WANTED:** Fifteen years experience production and raw materials scheduling, inventory control, personnel including insurance. Desire change—anywhere inside or outside United States. Box # 6, % Commercial Fertilizer, 75 - 3rd St., N. W. Atlanta 8, Ga.

**AGRICULTURAL** man desires to relocate. Experienced in basic chemical sales, promotional, development, and public relations work, also some industrial sales experience. College degree. Desire position in sales. Excellent references. Box 10, % Commercial Fertilizer, 75-3rd St., N. W. Atlanta 8, Ga.

### EMPLOYMENT OPPORTUNITIES

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Technologist, National Plant Food Institute.

ACS Monograph, 1960, 704 pages, \$18.00

Leading authorities in the field discuss the raw materials used in chemical fertilizers and the conversion of these materials to suitable chemical compounds for the feeding of crop plants.

Among the topics discussed are the factors controlling the preparation of conventional mixed fertilizers, the caking problem, the theory and practice of drying and cooling fertilizers, liquid fertilizers, and corrosion and methods of preventing it in the manufacturing process. Extensive coverage is given to phosphate ore, its mining and processing. In addition, the authors discuss nitrogen compounds, potash salts and granulated fertilizers. The book also includes a detailed description of the processing equipment used in a modern plant.

Broad in scope, accurate, completely up-to-date, this book will be of special value to chemists, chemical engineers, plant superintendents, and to management charged with the responsibility of selecting efficient and economical processes for the production of fertilizers.

**CONTENTS:** The fertilizer industry of the United States; Nitrogen; Phosphate Ore; Phosphate Rock; Normal Superphosphate; Manufacture of Triple Superphosphates; Wet-Phosphate Acid Manufacture; Diammonium Phosphate as Produced at By-Product Coke-Oven Plants; Operating Techniques, Equipment and Practices in Manufacture of Granular Mixed Fertilizers; Manufacture of Concentrated Water; Nitrophosphates and Miscellaneous Phosphates; Thermal Process for Producing Phosphate Fertilizers; Potash Occurrences, Processes, Production; Plant Practices in the Manufacture of Nongranulated Mixed Fertilizers; Minor and Secondary Elements in Mixed Fertilizers; Caking of Mixed Fertilizers; Fertilizer Materials; Liquid Fertilizers; Structural and X-Ray Data on Chemical Compounds Found in Fertilizers; Corrosion; Materials of Construction for Fertilizer Plants and Phosphoric Acid Service; Materials; Gaseous Effluence for Fertilizer Granulation Plants.

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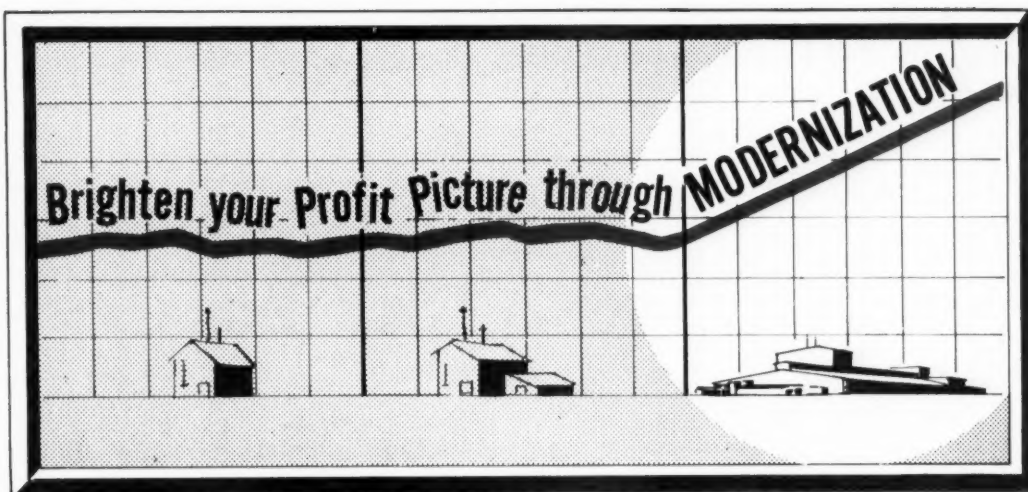
# CF Staff-Tabulated TONNAGE REPORTS

FERTILIZER TONNAGE REPORT (in equivalent short tons) Compiled by Cooperating State Control Officials and Tabulated by COMMERCIAL FERTILIZER Staff

STATE	January		December		Oct.-Dec. Quarter		January-June		July-December		YEAR (July-June)	
	1961	1960	1960	1959	1960	1959	1960	1959	1960	1959	1959-60	1958-59
Alabama	15,481	20,335	15,627	18,434	101,830	89,701	869,240	846,309	181,587	180,959	1,050,199	1,045,560
Arkansas	9,882	9,422	5,268	5,376	19,029	17,011	303,835	289,363	61,634	58,714	362,548	353,130
Georgia	31,712	39,496	48,225	49,835	181,314	163,516	1,102,220	1,130,998	313,241	299,194	1,401,414	1,425,749
Kentucky	-----	62,564*	-----	23,262*	-----	59,245*	461,786	483,820	-----	108,734*	570,520	591,380
Louisiana	11,205	8,576	7,177	6,670	39,930	31,468	224,087	201,642	73,814	66,744	290,821	265,794
Mississippi	17,825*	-----	11,028	20,070	65,307	68,869	547,221	516,917	145,632	144,374	689,797	693,288
Missouri	-----	12,602*	-----	34,053*	-----	124,202*	524,336	563,055	-----	277,708*	802,044	933,090
N. Carolina	70,678	69,754	38,330	42,969	131,674	115,087	1,381,263	1,468,704	202,694	175,533	1,556,796	1,696,759
Oklahoma	-----	2,617*	2,966	1,724	33,294	26,572	72,246	64,738	94,690	72,511	144,757	133,586
S. Carolina	30,504	30,971	14,541	22,132	63,732	57,460	678,986	756,100	110,096	104,903	783,889	890,302
Tennessee	21,338	34,738	9,380	10,479	41,164	38,359	480,429	443,602	124,747	117,275	607,727	570,718
Texas	27,352	26,946	24,842	33,196	109,667	117,901	474,627	441,851	234,376	233,410	708,037	664,651
California	(reports compiled quarterly)				242,846	253,956	813,116	803,261	462,347	465,495	1,278,611	1,262,996
Virginia	(reports compiled quarterly)				93,949	72,546	591,113	618,965	168,479	141,177	732,290	779,143
Indiana	(reports compiled semi-annually)				-----	-----	828,164	856,316	317,372	321,956	1,150,120	1,172,657
New Hampshire	(reports compiled semi-annually)				-----	-----	14,488	16,143	-----	3,694*	18,182	20,889
<b>TOTAL</b>	<b>218,152</b>	<b>240,238</b>	<b>177,384</b>	<b>253,854</b>	<b>1,123,736</b>	<b>1,052,446</b>	<b>9,367,157</b>	<b>9,513,181</b>	<b>2,490,709</b>	<b>2,382,245</b>	<b>12,147,752</b>	<b>12,499,692</b>
(not yet reported) * Omitted from column total to allow comparison with same period of current year.												

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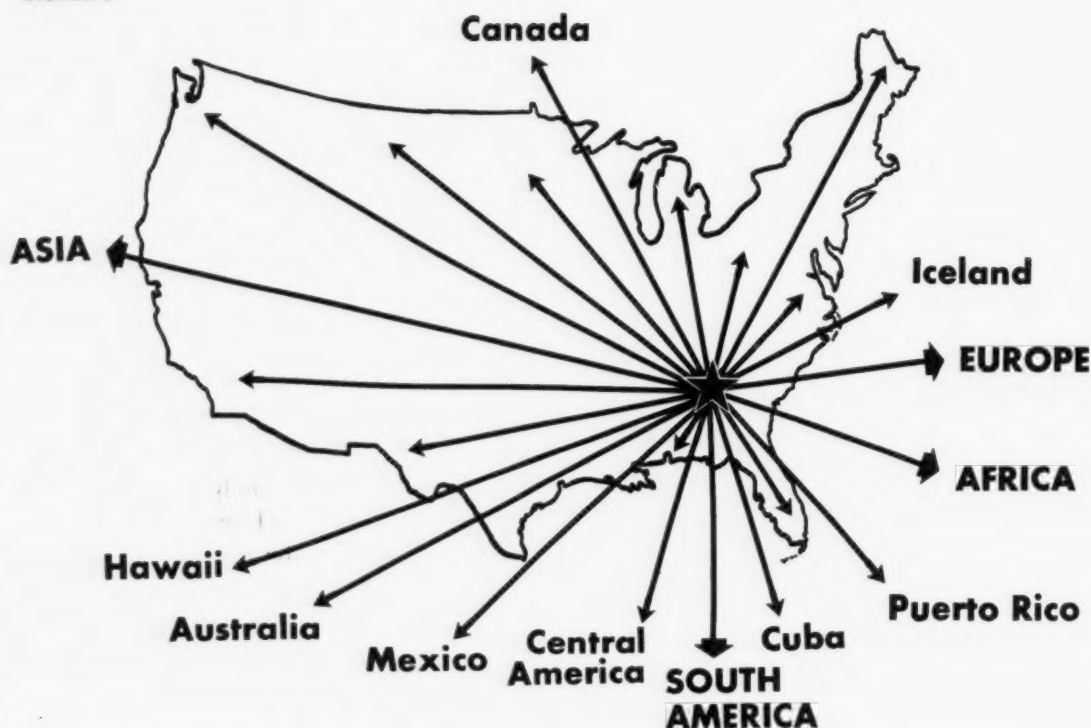
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